

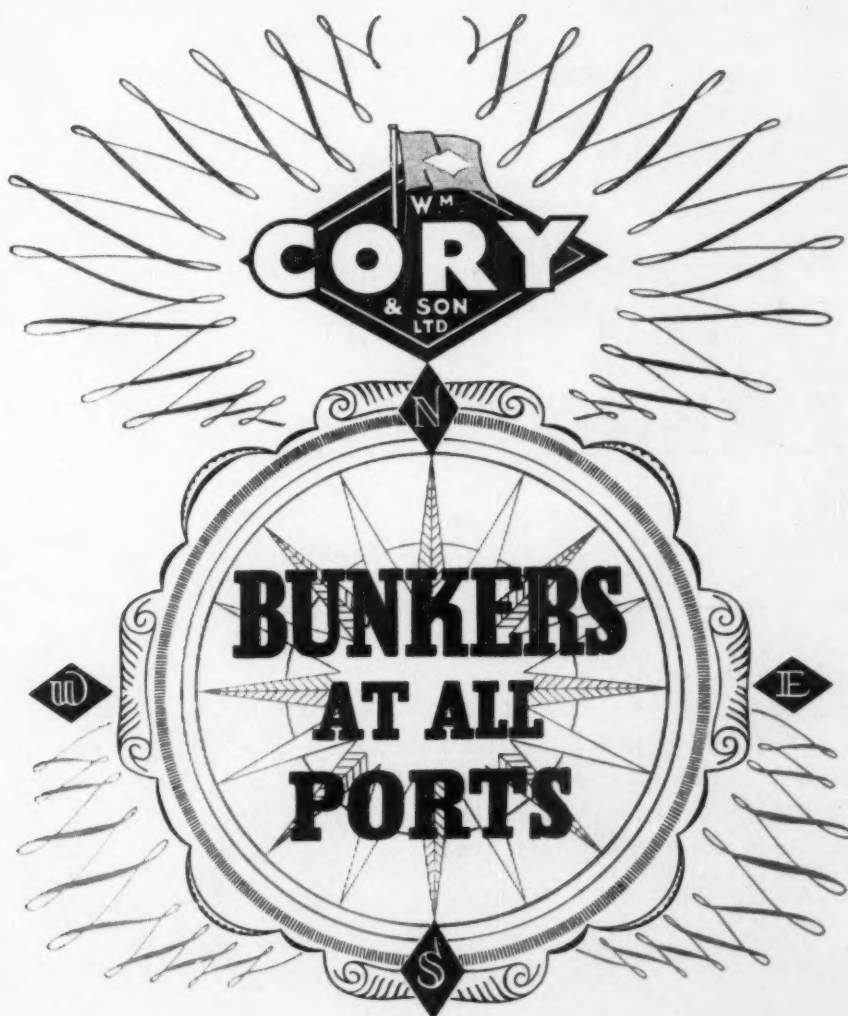
The SHIPPING WORLD



VOL. 144 No. 3523

15 FEBRUARY 1961

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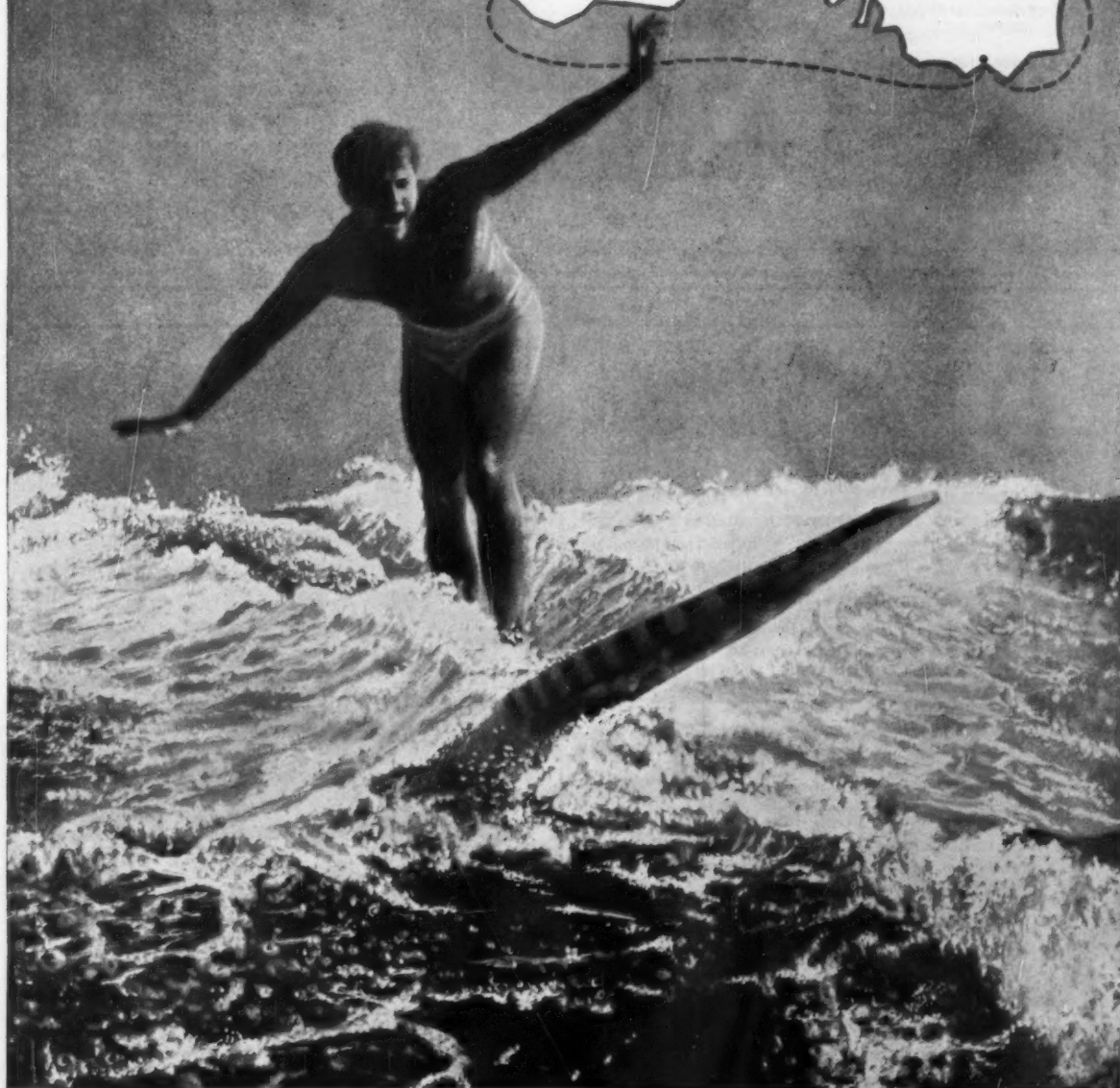
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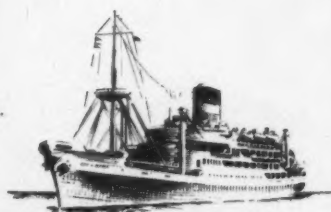
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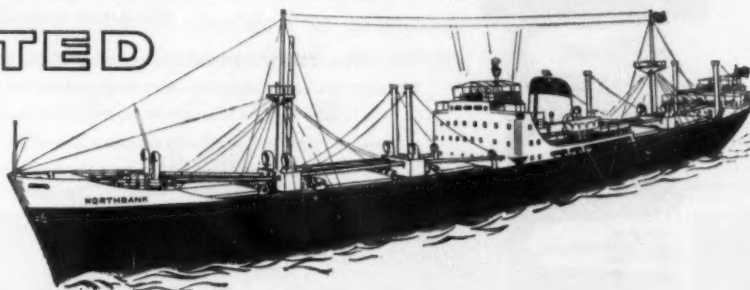
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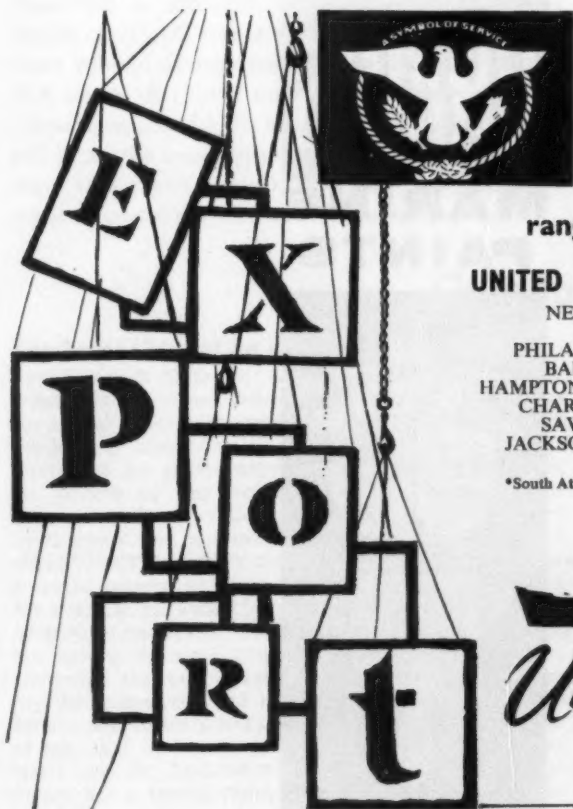
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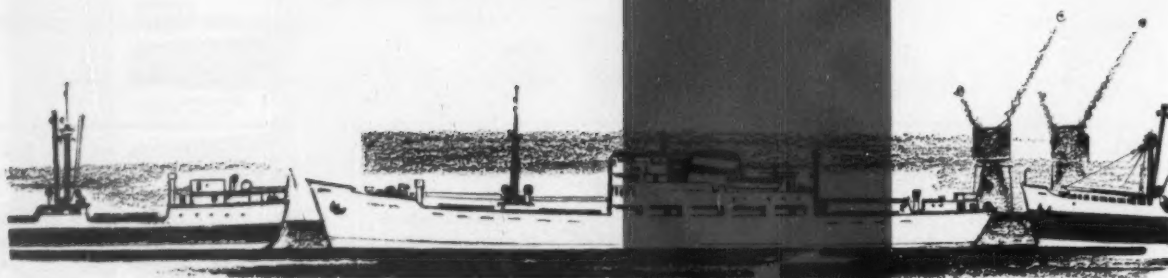
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THE SHIPPING WORLD

HEAVY INSURANCE LOSSES

THE annual report of the Liverpool Underwriters' Association holds out little hope of any reduction in premium rates, for either hulls or cargoes. Total losses in 1960 were particularly heavy, 114 vessels totalling 418,195 tons gross having been posted as totally lost. This is in fact the highest total recorded since 1946, when the figure was 469,109 tons gross, although it must be borne in mind that the total world fleet in 1960 was considerably larger than in 1946. Nevertheless a disturbing feature of the casualty figures is the number of losses affecting highly valued vessels of recent build, such as the tanker *World Harmony* and oil/ore carrier *Sinclair Petrolore*, both large, modern and expensive vessels. A matter of concern is that 11 tankers, totalling 114,682 tons gross, were totally lost during the year as a result of collision or explosion. Although total losses through weather damage are declining, there is a disturbing increase in the total losses due to stranding. This caused the loss of 61 vessels of 211,422 tons gross during 1960, which compares with an average over the last five years of only 43.4 vessels of 139,667 tons. As the report comments, "these figures, by far the highest for a number of years, are, to say the least, most disappointing at a time when some improvement might have been expected as a result of postwar development of navigational aids."

In the field of cargo underwriting, the report states that intense competition still prevails, and increasing costs leave little, if any, margin to meet losses. There has been some improvement as regards port congestion, and several port authorities have taken steps to speed up the turnround of ships and cargoes. However, adverse conditions prevail in many ports, careless handling of cargo continues to be reported, and inadequate protection of cargo against the weather has caused considerable losses. Adequate packing is, of course, a prerequisite to any attempts to reduce the incidence of pilferage. Delays in Customs clearance, lack of supervision, and insecure warehouses and compounds are stated to be factors which aggravate the situation.

In view of the casualty statistics and the cargo position, the Liverpool Underwriters' Association sees no cause for optimism. As the report states, although claims are being presented with a little less delay than formerly, the continuing rise in shipbuilding and repairing costs and the possibility of further general inflation must be constantly borne in mind by underwriters. No wonder that the experience of the Liverpool underwriters during last year, particularly in respect to total losses, leads them to conclude that it "emphasises the need for a more realistic rating of new tonnage."

Current Events

Tax Relief Claimed for Ports

THE DOCK & HARBOUR AUTHORITIES' ASSOCIATION (of which Mr M. Arnet Robinson was elected president at the annual meeting last week, in succession to Sir Kenneth Sinclair) is continuing to press the Chancellor of the Exchequer for an alteration in the assessment of profits tax payable by port authorities, and an increase in the investment allowance in respect of expenditure on port development and improvements. The Inland Revenue, it appears, seek to draw a distinction between the need for a special investment allowance for shipping and the need for a similar allowance for port authorities. The dry dock owners, as readers of THE SHIPPING WORLD well know, are having the same trouble in trying to persuade the authorities that expenditure on the provision of the large dry docks now required by modern ships is essential to the shipping industry and should qualify for some measure of tax relief or investment allowance. The annual report states that the Association is satisfied that the port industry has a special claim for tax relief. Heavy expen-

diture will have to be incurred in the near future in the modernisation of ports, many of which are in competition with near European ports, where the level of taxation is, generally speaking, lower than that in the United Kingdom. The Association intends to make further representations to the Treasury on both these matters at an early date.

Rating and Valuation Bill

THE NEW Rating and Valuation Bill is criticised by the Association. It is pointed out that the Bill contains provisions which will materially alter the calculation of the rateable value of port authority hereditaments and which constitute a reversal of Government policy adopted only some 30 years ago. "This change of policy will be to the financial detriment of port undertakings, and comes at a time when there is need for the modernisation and improvement of port facilities." In 1957, when the rates payable in respect of freight transport hereditaments were doubled, the Minister of Housing and Local

Government gave an assurance to a deputation from the Association that no further alteration in the derating of freight transport hereditaments would take place during the life of the Government then in office and the Association did not anticipate the proposed further alteration, especially at such an early date. The Association believes that a very strong case exists for distinguishing the derating of freight transport hereditaments from the derating of industry in general.

Effect of New Assessments

THE first shipyard to be re-assessed under the current revaluation programme in Scotland is Harland & Wolff Ltd, Govan, whose rateable value is stepped up from £10,840 to £30,000. The foundry at Helen Street, Govan, has been re-assessed at £26,500 as against £7,031. Another firm in this area, British Polar Engines Ltd, goes up to £10,118 from £2,824. Whether this will be the general pattern of revaluation in Glasgow remains to be seen. It is in line with the trend towards higher figures for industrial properties, which may well be carrying 70 per cent of the city's income by 1963, to quote Mr W. Hope Collins, president of the Glasgow Chamber of Commerce. Assessments so far published show that commercial and industrial firms are facing new values, two, four and six times the former figure. How much that will mean in actual cash payment will be known only when the city produces its new rate per £1. An assurance has been given that the city will not spend more money than at present and that the obvious result will be a lower rate per £1 on a much higher assessment than at present. Whether lower per £ rating will compensate for higher values is a moot point. To quote Mr Hope Collins again, his own firm will face an increase of £18,000 per annum more in costs, even if the rate is stabilised at 20s per £1. It has been suggested that such increases are not excessive and that they will not mean any serious discomfort to commercial concerns, but every additional cost is a serious matter in a difficult selling period. If commerce and industry provide 70 per cent of Glasgow's annual income by 1963, as has been suggested, the question might well then be raised whether in that event spending of the money ought not to be more closely controlled by those who provide it. Whether it is fair or not (and it is accepted that in many cases industrial properties may have been undervalued) the fact remains that the present redistribution of the rate burden will not make life any easier for those seeking to attract business to the Clyde.

Turkish Tax on Freights

TURKEY is the only European country to impose a tax on outward freight. Such a tax is always an unwarrantable imposition, but recent changes in the conditions governing this tax have introduced even more unsavoury features. According to the Baltic & International Maritime Conference, until the end of 1960 foreign liners were charged a freight tax of 4.8 per cent, although there were certain exemptions in the case of chartered ships. Then in January of this year not only was this rate increased to 7.4 per cent, but the rate for 1960 was increased to 6.6 per cent, retroactively with effect from 1 January 1960. On top of this, all exemptions were withdrawn, although of course the freight tax is not imposed on Turkish vessels whose freight rates are paid in other foreign currencies. This is just another manifestation of flag discrimination in one of its manifold forms. Is there, in fact, any valid reason why Turkey should levy tax on freight payable to foreign vessels for services performed on the high seas? So far as tramp shipowners are concerned, the Baltic Conference considers that the only remedies available are to increase freight rates; to fix vessels to load in Turkey only with charterers not domiciled in Turkey; to make

freight payable outside Turkey; and to stipulate "Turkish freight taxes unless settled by shippers or charterers before arrival of vessels at destination to be paid on delivery of cargo by receivers."

New Israeli Passenger Liners

PRELIMINARY details are now available of the two passenger liners under construction in French shipyards for the Zim Israel Navigation Co Ltd, Haifa. The first of the two to be completed will be the *Moledet*, 6,400 grt being built at the Nantes shipyard of Ateliers et Chantiers de Bretagne. She is due to enter the company's service between Haifa and Marseilles. On this route she will carry 620 tourist-class passengers, but arrangements have been made for easy conversion for the Haifa-New York service with a reduction in the number of passengers. She will be a single-screw ship with a raked stem, bulbous bow and cruiser stern. There will be four continuous steel decks and three tiers of superstructures. The ship is divided by seven watertight compartments. The displacement will be 6,780 tons. Arrangements have been made for a hold capacity of 500 cu m and garage facilities of 525 cu m. The entire passenger and crew accommodation will be air conditioned. Denny-Brown stabilisers are to be fitted as well as a particularly extensive range of navigational instruments. The second and considerably larger vessel, *King Solomon*, is of 23,000 grt, and was ordered last summer from Chantiers de L'Atlantique (Penhoet-Loire), St Nazaire. This ship will have 10 continuous decks. The machinery of the *King Solomon* will be geared turbines of 22,500 shp of Parsons type built by the shipbuilders, whereas the *Moledet* is to be fitted with two S.E.M.T./Pielstick diesel engines with a total output of 6,370 bhp. Amenities in the *King Solomon* will include an open air swimming pool and lido, a theatre, winter garden, a chapel and a synagogue and a large number of public rooms. There will be a swimming pool aft for the crew. She will have a deadweight capacity of 6,300 tons, and will be used on the Haifa-New York service of the owners and possibly for cruising during off season periods.

German Ship Reactor Project

A CONTRACT which has been signed in Hamburg provides for Euratom's participation in a nuclear marine propulsion project currently being carried out by the Hamburg Gesellschaft für Kernenergieverwertung in Schiffbau und Schifffahrt b.m.h. The contract was signed by the European Atomic Energy Community (Euratom), the Gesellschaft für Kernenergieverwertung im Schiffbau und Schifffahrt, and also by the firm of Interatom (Internationale Atomreaktorbau G.m.b.H., Bernsberg/Cologne). An agreement providing for joint development of a nuclear marine propulsion unit of the organic moderated and cooled reactor type (OMR) was concluded early in 1959 between the firm of Interatom and the Gesellschaft für Kernenergie-Verwertung, which had been making a two-year preliminary study of the problem. This one-year contract was later extended until 1961, by which date it was planned that the design work and special tests scheduled to be carried out would produce working designs. The negotiations which have now been completed provide for 40 per cent Euratom participation in the project. This participation is retroactive, and will cover the whole design phase for the organic moderated reactor up to and including the completion of working designs, which are expected to be ready by the end of 1961. Under the contract, Euratom will contribute a sum of up to DM4.48 mn to the project. Once designs for the nuclear marine propulsion unit have been completed, tested and approved, it is intended to go ahead with the construction and trials of the propulsion unit in an actual vessel. Under the contract, Euratom will be able, if it so wishes, to be

associated with this work. The plan is to build a new vessel and an invitation to tender has been issued by the Gesellschaft für Kernenergie-Verwertung; German shipyards had until January 31 to submit proposals. The ideas of the company are centred on a vessel with a tonnage of about 22,000 dwt.

Coordination of Efforts

ONE OF Euratom's objectives is to coordinate the various efforts being made in the field of nuclear marine propulsion and to encourage the exchange of information and experience. At the present time, it is negotiating three further contracts, one of which is due to be concluded very shortly. The first of these is a contract with the French Atomic Energy Commission for the construction of a gas-cooled high power ship's reactor. This type of reactor is another considered to show promise for use in nuclear power plants. The second is a contract with Fiat and Ansaldo of Italy for a light water-cooled ship's reactor operating on enriched uranium, and the third is a contract with various bodies in the Netherlands for the construction of a pressurised water ship's reactor. In these cases, the parties to the German agreement will have an opportunity of seconding staff to exchange ideas and information, just as experts from various groups in other Community countries will be able to benefit by the experience gained with the German project. No decision on the actual construction of the German vessel will be made before the beginning of 1962 at the earliest. It is estimated that the ship will take two to 2½ years to build and that, given present costs and wages, the cost will be in the region of DM35 mn.

Anti-Freeze

FOR the first time in its history, running back over some 250 years, the port of Leningrad has been open right through the winter, though the river Neva and the eastern part of the Gulf of Finland for over 50 miles out have been icebound as usual. This phenomenon is the result, of course, of the unusually mild winter, which made it possible for ships to enter the port without the aid of icebreakers right up to the middle of January, since when their passage has had to be facilitated by the six icebreakers and ten tugs available at Leningrad for that purpose. According to a statement made to a correspondent of the Soviet *Tass* Agency by one of the responsible officials of the port, it is hoped that this year's happy experience will be made regular, independent of meteorological conditions, by artificial means. Two methods of preventing the water from freezing, even in the coldest weather, are being examined. One of these involves the laying along the approaches to, and the wharves of, the port, of submarine pipes with small apertures through which hot air is bubbled up through the water, thus carrying a steady stream of warm particles of water to the surface. The other is to use suction dredgers to break up the ice as it forms, possibly in conjunction with screws which mix warmer water from near the bottom with the cold water at the surface.

Radar Simulators Prove Themselves

ONE OF the articles in the current issue of *The Journal of The Institute of Navigation* is a paper by Capt J. H. Quick of the Ministry of Transport, in which he describes the development of marine radar simulators and the way in which they are being used. This paper was given originally in Germany in the latter part of last year, but will be new to most people in Great Britain. Courses on radar navigation employing radar simulators are now being run in the United Kingdom at two colleges, each course lasting five days and being limited to six students,

who are drawn as far as possible from serving masters or senior chief officers about to take command. Capt Quick describes the reactions to the course of those taking it. Many senior masters, sent to take the course by their company, arrive with the conviction that it will be a waste of time. By the second or third day they are extremely interested, and by the end of the course many are so enthusiastic that they ask for a refresher course in the near future. This is unfortunately not possible at present as applications for admission to the courses far exceed the numbers which can be accommodated. However, three additional courses are being established, and Capt Quick reports that when the backlog of untrained masters has been reduced it may be possible to run refresher courses, though these will probably be modified to suit the greater experience of those taking them.

History of Development

MARINE RADAR SIMULATORS are made in Great Britain by three manufacturers, who acquired their knowledge of the techniques involved by producing equipment for the Services and for teaching aircraft pilots. It may not be generally realised that in the marine field the initial moves came from the Ministry of Transport. Capt Quick describes how a decision was taken at the Ministry of Transport in 1955 to carry out experiments in order to produce a marine radar simulator for instructional purposes. The resulting prototype simulator was used for trial courses and to demonstrate to representatives of the shipping industry how a simulator could be used. However by the time that research into training methods had been completed, the three manufacturers already mentioned had developed more sophisticated simulators. Drawing on the experience of both sides, the Ministry produced a specification covering the minimum requirements for a marine radar simulator which could be used to demonstrate and practise collision avoidance manoeuvres, and this forms the basis for the certificate of type-testing which is issued by the Ministry.

Commercial Operation of Hydrofoils

THE United States Maritime Administration has signed a contract with Stanford Research Institute to prepare an economic study on the commercial potentiality of hydrofoil craft. The contract calls for completion of the study in six months at an estimated cost of \$60,000. An experimental 104-ft 80-tons hydrofoil vessel is being built for the Maritime Administration on Long Island, N.Y., by Grumman Aircraft Engineering Corporation, and present schedules call for the craft to be ready for tests in mid-1961. The objective of the study will be to identify trade routes of interest to the Maritime Administration for hydrofoil operations, and to evaluate both the economic and operational feasibility of future commercial hydrofoil craft. The routes studied will be restricted to those which could be served by "first generation" hydrofoil craft. These are assumed to be limited to maximum speeds of some 60 or 70 knots, a weight of about 500 tons, and a cruising range of between 500 and 1,000 nautical miles. Doubtless study will be made of the hydrofoil services already in commercial operation in the Bay of Naples, the Straits of Messina, Lake Maggiore, in the Baltic and on Lake Maracaibo.

A £4 MN PROJECT to increase the capacity of the port of Mombasa was officially opened on February 3. The project comprises a causeway linking Mombasa Island with the mainland by rail and a roadway, and four new deep-water berths, bringing the total of deep-water berths to 13. Two of these new berths have been provided with transit sheds, marshalling yards, stacking yards and cranes. The remaining two berths will be kept in reserve for future port development.

ON THE "BALTIC"

ACTIVITY OF CHINESE CHARTERERS

By BALTRADER

THERE is still a feeling of surprise on the Baltic Exchange that freights have not risen more since the turn of the year in view of the large amount of chartering which has been arranged. A steady undertone is all very well, but it does not satisfy owners who are looking for a level of freights to justify their capital costs and operating expenses. However, freights have in fact advanced and there is plenty more business in prospect, and in some directions it can be seen that charterers are finding less choice of tonnage of the type they require. The British liner companies are regularly in the market for vessels of good type for West African rounds and trips to the Persian Gulf and other destinations; there is also a good demand for tonnage on time charter with delivery in United States ports. These various inquiries are not so easy to fill with the right kind of ships as they were a month or two ago.

The Chinese charterers have drawn heavily on the supply of fast modern tramp vessels for time charter of many months' duration. They may well prove to have shown wisdom in their recent activity in this field and in their continuing search for good ships on time charter; other operators may regret not having done the same thing while rates were at a comparatively modest level. The Chinese have been busy in taking ships on time charter with delivery not only in the Far East, but also at European ports, so that the effect on the market is widespread. It is to be presumed that most of the vessels delivered on time charter on this side for Chinese account will take fertiliser as an outward cargo. The fertiliser trade has been on a very large scale for a good many years. Fertiliser cargoes from Belgium, Holland, Germany and Italy to China, Japan, Formosa and India have given much employment to vessels whose owners prefer a voyage via Suez to one involving a ballast passage to the U.S. for a cargo to the Far East via Panama.

So far the market which has shown the most firmness has been the River Plate. Many fixtures have been arranged for destinations in Holland, Belgium, Germany, Italy and Japan, but inquiry for grain from the River Plate to the United Kingdom has been conspicuous by its absence for some weeks, apart from a parcel or two. The estimate for this year's Plate maize crop is slightly larger than last year, and demand on this side should be considerable in view of Europe's setback both in sowing and reaping.

Carriage of Motor Cars

Many shipowners greatly miss the plentiful supply of motor cars which for some years the British and other European manufacturers were ready and anxious to ship to America in every vessel available. Most of the tramp vessels carried the cars unboxed and therefore not stowed in tiers. They could therefore only carry as many as would stand on the tank tops and the tween decks. This was wasteful of space but saved the expense and time and the cargo of say, 250 to 350 cars, while showing no profit on the voyage, much reduced the expense of an otherwise ballast passage to an American loading port. The comparatively small export of cars today does not provide enough employment for the vessels which were fitted with false decks for the trade. However, even if American demand for imported cars should not return to its recent importance and value to shippers, it would only be in keeping with the pattern of shipowners' experience through

the generations. In the lifetime of shipbrokers still using the amenities of the "Baltic", how many established trades have disappeared, although in their time they seemed to be indispensable to tramp ships? To name the most important, there was the almost worldwide distribution of Welsh and North Country coal. Since the war we wondered for years what would happen when scores of large ships ceased to be wholly engaged in bringing American coal to Europe; this has now shrunk to unimportance. Particular trades may wax and wane, but the movement of commodities about the world continues to grow with the increase of hungry populations and the ever more active transport of raw material and manufactured goods.

The Freight Markets

Somewhat quieter conditions have been noted in the past few days, but the tone is steady, both charterers and owners being inclined to temporise. For grain from the U.S. Gulf to the United Kingdom owners were holding for 60s but eventually 58s 6d was accepted, this being 4s 9d more than last paid several weeks ago. Inquiry from the River Plate has eased; a tanker was fixed from River Plate to near Continent at 55s, the first such tanker fixture for some months.

Fixtures include: Saguenay vessel, St Lawrence to picked ports United Kingdom, 47s 9d wheat, April 5/30; *Stamos*, 10,700 tons U.S. North of Hatteras, 50s, heavy grain, February 24/March 6; *Dartmoor*, 6,600 tons, up River Plate to Moji-Tokyo range, 130s, bagged pollards, option 8,500 tons 5 per cent, 67 cu ft, 102s 6d, or 6,000 tons heavy grain and 2,500 tons pollards, 87s 6d and 130s respectively, May 5/29; *Lodestone*, 470,000 cu ft bale, Philippines to Antwerp-Hamburg range, 18½ cents, copra, February 15/28; Italian vessel, 520,000 cu ft bale, two ports Japan to two ports U.S. Gulf, general cargo, \$62,500 f.i.o., February 18/25; *Margit Brovig*, 13,500 tons coal, \$8.30, February; vessel, 9,500 tons, Rangoon to Cuba, 70s rice, combined with Cuba to South China, 91s 6d, Shanghai 92s 6d, North China 93s 6d, February 20/March 5; *Onosa*, 10,000 tons, British Columbia to United Kingdom, \$12 f.i.o., March/April, lumber and general cargo; vessel, 14,242 tons, 690,000 cu ft bale, 14 knots on 18 tons intermediate fuel plus 1 ton diesel, 22s, 6/9 months, delivery Copenhagen (Chinese charterers) *Valldemosa*, 10,040 dwt, 498,493 cu ft bale, 10½ knots on 8 tons diesel, plus 2½/3 tons fuel oil, one West African round, 17s 3d, delivery Immingham, February 11/14; *Dunkery Beacon*, 11,179 dwt, 579,000 cu ft bale, 23s, trip, delivery Rotterdam, re-delivery Madagascar-Reunion or Mauritius, February 13/16.

The following have been elected as members of the Baltic Exchange: Messrs J. M. Young (Judge & Son Ltd); A. J. Viassopoulos (Tony Vee Ltd); R. M. Maxwell (Coral Shipping Ltd); The Hon. W. Normand (Henry Hosegood & Son Ltd); G. H. R. Radford (Staley Radford & Co Ltd); A. L. Gaisford (Brown & Polson Ltd); G. E. Mavroleon (G. E. Mavroleon Shipping Enterprises Ltd); J. R. King (The Overseas Farmers' Cooperative Federations Ltd); G. W. Angell T. D. Bailey & Son Ltd); A. B. Normand (H. Clarkson & Co Ltd); J. R. Carr and E. M. Dallimore (Gueret Llewellyn & Merrett (1951) Ltd); S. E. Fowler (Thos. R. Miller & Son); F. J. Proctor (Latus Linsley & Co (London) Ltd); L. A. Waite (Howard Houlder & Partners Ltd); and F. T. Sansom (Sansom & Fisher Ltd).

NEWS FROM OVERSEAS

From THE SHIPPING WORLD'S Own Correspondents

Indian Orders for Japan

THE Great Eastern Shipping Company, of Bombay, has signed a contract with the Hitachi Shipbuilding & Engineering Co of Japan for two cargo motorships of 12,700 dwt each. With a speed of 16.5 knots, they will cost £851,000 each and are scheduled to be delivered in January and February 1962 respectively. This is the biggest single shipbuilding contract signed between the two countries so far. As regards payment, the Great Eastern Shipping Company is expected to borrow 85 per cent of the necessary foreign exchange through a private arrangement with a mercantile bank in London, while the Government of India is said to have agreed to release the remaining 15 per cent from its own foreign exchange funds. Under the terms of the contract 5 per cent of the price of the ships will be paid when the export licence is obtained by Hitachi, 5 per cent at the time of keel laying, 5 per cent at launching and 85 per cent on delivery. According to Mr K. M. Sheth, manager of the shipowners, the contract represents a reduction of £60,000 in the price for the two ships over what they would have cost if built on an 8½ years' deferred payment basis.

Pakistan's Second Five-Year Plan

Pakistan's merchant fleet rose to 180,000 dwt in 1955, but the ships acquired were assorted craft, mostly over 30 years old. There were only six ships of about 50,000 dwt which could be regarded as modern. The object of the first Five-Year Plan was to develop a dependable modern merchant fleet to carry the coastal trade as well as to share in the country's foreign trade. It was proposed that a National Shipping Corporation should be formed to participate in both coastal and international traffic. A Government loan of Rs60 mn was included for the purchase of six or seven modern ships and for working capital. Because Pakistan shipping companies showed readiness to invest in developing the industry, the proposal to form a National Shipping Corporation was not proceeded with. These companies have since purchased ten comparatively new cargo ships. There are now 26 ships in the fleet, 16 of which are less than 20 years of age. These handle some 700,000 tons of cargo a year between West and East Pakistan.

During the Second Five-Year Plan period it is proposed to build three ships at a total cost of Rs27 mn. There is now said to be enough tonnage available to handle the coastal shipping. The ten old ships, however, require replacement. There is at present no pilgrim ship in the merchant fleet, and foreign ships have to be chartered for Haj pilgrim traffic. To save their current foreign expenditure, it is said to be necessary to buy ships for this traffic. As secondhand ships are not available, the only satisfac-

tory answer is to build new ships to suit this special traffic. It is, therefore, proposed to start with one pilgrim ship, estimated to cost Rs15 mn.

Until recently there was no Pakistan ship on the international trade routes. The entire foreign trade was carried by foreign shipping companies. Freight earnings remitted by foreign companies amount to some Rs80 mn a year on the trade between Pakistan and Western Europe only. The Planning Commission states that in the Second Plan, six ships for general cargo would be the minimum needed for a monthly sailing to Europe. These have been provided in the Plan at an estimated cost of Rs40 mn, out of which Rs20 mn will be paid during the Plan period.

At present almost all the oil requirements of Pakistan are brought by foreign tankers. The total freight bill of these tankers amounts to Rs27 mn per annum. The Maritime Commission has recommended the acquisition of tankers for this trade and the Second Plan provides for the purchase of two tankers at an estimated cost of Rs6 mn. The entire expenditure for the purchase of ships will be in foreign exchange and all in the private sector.

Passenger Ship for Pakistan

PAKISTAN'S first new passenger ship began operation in January, reducing the time taken for the voyage between Karachi in West Pakistan and Chittagong in East Pakistan by one day. The ship, the *Shams*, has been purchased from Japan by a newly floated Pakistan firm—Crescent Shipping Lines Ltd, of Karachi—at a cost of Rs20 mn. The *Shams*, built by the Hitachi Shipbuilding & Engineering Co Ltd of Japan, has a gross tonnage of 9,000 tons and a deadweight of 5,700 tons. She has 100 cabin class and 1,100 deck class berths, and will operate between Karachi and Chittagong via Colombo, replacing the *Aronda* of the British India Steam Navigation Company. She is a twin-screw motorship with two 9-cyl B & W diesels and has an overall length of 460ft.

Norwegian Tanker Orders

MELSON & MELSON, Larvik, have ordered a tanker of about 58,000 dwt from Kockums M.V. She is to be delivered in March 1963 and will be powered by a Kockum de Laval turbine. This vessel will be the largest vessel so far in the Norwegian fleet and when ordered only three of 65,000 dwt placed at Akers mek. Verksted were larger. However, all these three orders are option contracts, and they may thus be of quite a different size when eventually built. Later it was announced that Jorgen P. Jensen, Arendal, had placed an order for a tanker of 66,500 dwt at Akers mek. Verksted. This vessel is to be delivered in 1964, the same year as Th. Brovig's tanker of 65,000 dwt is to be delivered. Akers mek. Verksted say that it

FIRST 1961 DELIVERY FROM KOCKUMS

The motor tanker "*Ariadne*", 19,900 dwt, built for the shipowners A/S Athene v/ Jorgen Bang, of Kristiansand, Norway, is the first delivery of the year from Kockums Mek. Verkstads A/B, Malmo, Sweden. Of all welded construction, the main particulars are length o.a. 557ft 9in, length b.p. 525ft 8in, breadth moulded 71ft 9½in, depth moulded 40ft 1½in and draught 30ft 11½in. The oil cargo space has a capacity of 960,110 cu ft



would be quite possible for them to deliver two vessels of this size in 1964. As mentioned above, the Brovig order is as yet only an optional one and it remains to be seen what will eventually be the outcome. Mr Jensen's order is so far for the largest vessel in the merchant marine and it has already been decided that she will be powered by a 10-cylinder Aker-built B & W engine which will develop 21,000 bhp, scheduled to give a service speed of 17 knots. Other particulars of the vessel are: length o.a. 830ft 8in, l.b.p. 787ft 5in, breadth moulded 112ft 2.5in, depth moulded to main deck 57ft 1in. For a capacity of 66,500 dwt the draught will be 41ft 7.5in to the summer loadline, but the owners may want to increase the capacity to 67,000 dwt and in that case her draught will be 42ft 3in. The hull of this vessel will be built at Stord and taken in tow to Akers Verft where the fitting out will be completed and the engine installed. As yet the vessel has not been fixed.

Another interesting order was announced almost simultaneously. Mr Sigval Bergesen d.y. has ordered two tankers each of 56,000 dwt at Chantiers de l'Atlantique with options both as to size and delivery dates. Delivery dates were outside the possibilities of Rosenberg mek. Verksted, in which Mr Bergesen is the main shareholder and where he has so far built most of his vessels. In fact the yard has at present orders for five tankers of 51,000 dwt each from his firms, the first one to be delivered in May next. Of these five tankers, four have already been fixed on seven-years' charterparties. They were fixed as early as 1956-57 at very good rates. The second of the 51,000-tonners from Rosenberg will be delivered in January 1962 and the others will follow as soon as possible. An order for a shelterdecker of 15,000 dwt placed by A/S Ocean (John P. Pedersen & Son) Oslo, at Nederlandsche Dok en Scheepsbouw Mij, Amsterdam, is to be delivered in the first quarter of 1963.

Analysis of Norwegian Orders

THE NORWEGIAN *Journal of Commerce and Shipping* recently printed an analysis of the orders placed by Norwegian owners during the last three months. Of 33 orders placed, 23 are for dry-cargo vessels and 10 for tankers. The last tanker for Akers is not included among the ten. Of the dry-cargo vessels 16 are of 15,000 dwt or more. The largest are even as much as 38,000 dwt but these are options only. Of the 16 orders two have gone to Norwegian yards, three to Sweden, one to Holland and as many as ten to German yards. Of the rest of dry-cargo vessels, seven in number, Norwegian yards have received orders for four, all of them cargo liners of between 8,000 and 9,000 dwt. Norwegian yards have also obtained orders for two tankers of 19,800 dwt, one of 34,000 and one of 41,200 dwt. In addition to the above, and not included in the orders placed by Norwegian owners, Norwegian yards have received two orders for cargo liners from abroad, from Sweden and Hong Kong.

Marinens Hovedverft, Horten, have announced that the dry dock now being built and which will accommodate ships of up to 50,000 dwt, will be completed in October next and the cost will be held within the limits stipulated by the Storting (the yard is State owned), Kr25 mn.

American Shipping Notes

A SPECIALISED ship capable of carrying 15,100 tons of molten sulphur has been completed at the Key Highway Yard of the Bethlehem Steel Company in Baltimore. The *Marine Sulphur Queen*, a 523-ft vessel converted from the T2 tanker *Esso New Haven*, has four insulated cargo tanks which are heated by internal steam coils. Reportedly the first oceangoing vessel to be devoted exclusively to the transportation of molten sulphur, she will be operated by Marine Transport Lines of New York under a long-term

contract with the Texas Gulf Sulphur Company. Another large bulk carrier launched by American ownership is the 669-ft *J. Louis*, a bauxite ship of 32,490 dwt for the Reynolds Metals Company. The second self-unloading ship built for these owners, she will carry aluminium ore between Jamaican, Haitian and Texan ports.

The first exchange of a Liberty ship for a superior war-built vessel, under a law enacted at the last session of Congress, has been completed. Eugene Panagopolos, owner of Midwest Shipping & Trading Corporation, conveyed to the Government the U.S.-flag Liberty ship *Albatross*, built in 1943, and obtained in exchange the C2-type *Mormacmoon*, on payment of a difference in value of \$417,120. The Maritime Administration has 17 other exchange proposals under study.

Contracts have been placed for eight new dry-cargo ships under the fleet replacement programmes of two steamship lines, within the space of less than a week. On January 30, the Maritime Administrator announced that he had signed, with representatives of American Export Lines and Sun Shipbuilding & Dry Dock Co, orders for four vessels of design C3-S-46b, at a total cost of \$35,080,000. The vessels, to ply between the U.S. North Atlantic Coast and the Mediterranean, will measure 493ft overall and 10,133 dwt, and will have a speed of 18½ knots. On February 1 another four-ship order was executed, between the Government, Lykes Bros Steamship Co, and the Sparrows Point yard of Bethlehem Steel Co. The total cost in this case is \$34,156,000, the ships to be of design C3-S-37, measuring 495ft in length and 11,000 dwt, with a speed of 18 knots.

The Federal Maritime Board has announced that it will hold hearings on the application of the Isbrandtsen Co and American Export Lines to coordinate their services in the berth trades through conveyance of Isbrandtsen's liner fleet to Export. Strong opposition to the plan has been expressed by Prudential Steamship Co, which maintains that the Mediterranean cargo service of its 5-ship fleet would be seriously injured by the creation of what is in effect a 42-ship competing line.

In Short

A CONTRACT was signed recently in Moscow between Sudimport, the Soviet trade corporation, and Centromor, the Polish foreign trade corporation, for the construction of a B-70 type tanker of 19,000 dwt, to be delivered by December of this year. This ship will be built at the Gdansk shipyard, which already has a contract for the building of two others of the same type, the largest yet built in Poland, for China.

A CONTRACT worth £5,000,000 for transport and loading equipment for Lower Buchanan, the new port in Liberia for loading iron ore from the Rimba mines, which are to be exploited by the Lamco syndicate, has been awarded to AS Nordströms Linbanor, Stockholm. Assembly of the new plant is to start in the first half of 1962, and it will be completed in March 1963. The ore is to be transported from the mining site, 165 miles inland, in railway cars with a capacity of 90 tons each. These will be discharged automatically at a rate of 70 cars an hour, which corresponds to about 6,000 tons an hour. The loading equipment on the quay will have a capacity of 6,000 tons an hour.

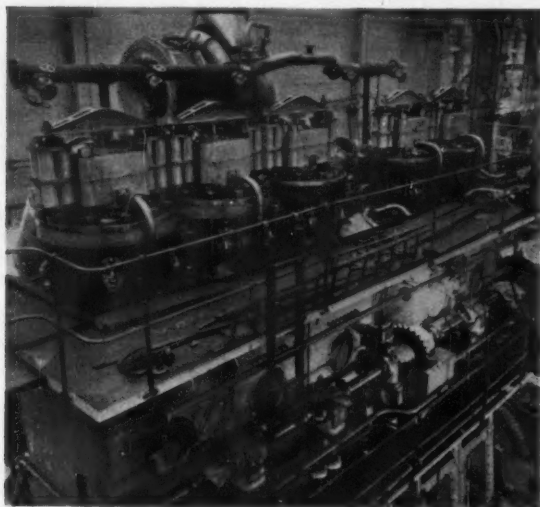
THE SWEDISH merchant navy consisted of 1,134 ships of 100 gross tons or more, with an aggregate tonnage of 3,834,000 grt at the end of 1960, according to the Swedish Board of Trade. This means a net increase of 22 vessels and 234,500 grt over the year. Most of the increase was accounted for by newly built tonnage. Tankers rose in number by one to 169, the tonnage increasing by 43,000 to 1,306,000 grt. Combined ore carriers/tankers were up by five to 29, with an increase in tonnage of 88,000 to 409,000 tons. For refrigerated vessels there was an increase of eight units to 32, the tonnage being up by 50,000 to 152,000 tons. Passenger vessels increased in number by seven to 100, but decreased in tonnage by 4,000 to 120,000 tons. The group "other vessels" showed an increase of 16 to 688 units, corresponding to an increase in tonnage of 59,000 to 1,829,000 grt.

BRITISH-BUILT GÖTAVERKEN ENGINE

N.E.M. Engine for Cargo Ship "Montrose"

TEST BED trials have been completed on the first Göta-verken engine to be built in Great Britain or the Commonwealth. This engine, which has been built by the North Eastern Marine Engineering Co Ltd, Wallsend, has now been dismantled and is being installed in the cargo vessel *Montrose*, 8,590 dwt, under construction at the Sunderland shipyard of Bartram & Sons Ltd for Buries Markes Ltd, London, and due for delivery in March. This engine was completed in 13 months from the receipt of the order, which is a very short period indeed for a new type of engine to be planned and built. There are a further five N.E.M.-Göta-verken engines on order—two for British owners, one for Swedish and two for Norwegian owners.

The engine which has just been completed is a standard Göta-verken two-stroke single-acting type DM 760/1,500/VGS/5U engine having five cylinders and turbocharged on the constant-pressure system. A Napier exhaust gas turbo blower is fitted. The engine has been designed for a continuous rating of 6,300 bhp at 112 rpm with a bmep of 107 lb/sq in, and weighs about 290 tons. It is able to operate on boiler fuel, and the injection valves have a



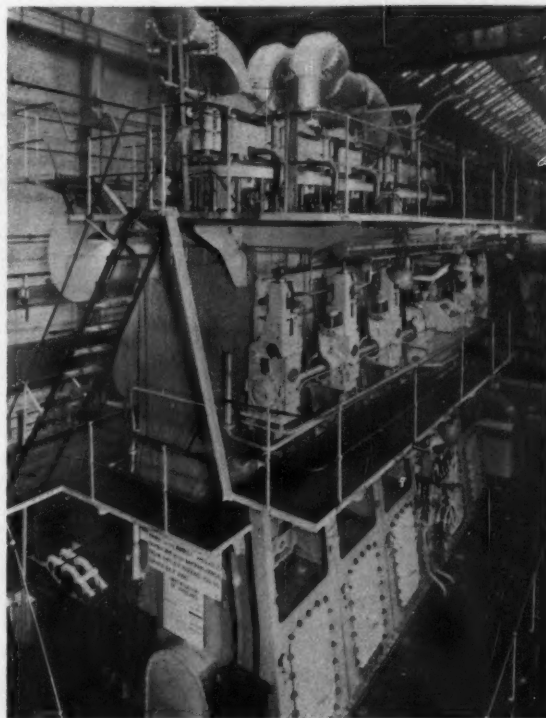
Top of engine showing the exhaust valve-operating yokes and return springs

separate cooling circuit, in which diesel oil is normally used as the cooling medium.

The crankshaft, which in this engine has been made in Sweden, is in two coupled parts, with crankpin and webs of cast steel in one piece, and with the main bearing journals shrunk into the webs. The crankwebs carry cams for operating the pull rods for the main exhaust valves. The bedplate is fabricated in steel with cast steel housings welded to the main cross girders. The Michell-type thrust block is integral with the bedplate.

The entablatures are also of welded construction and designed as box-type units, one for each cylinder, each unit comprising a rigid cast steel cylinder support welded to a pair of column members. When these units are bolted together with fitted bolts a continuous scavenge air receiver is obtained.

Wear-resisting cast iron is used for the cylinders which are fitted with water cooling jackets. The cover comprises two parts, the lower combustion space portion being



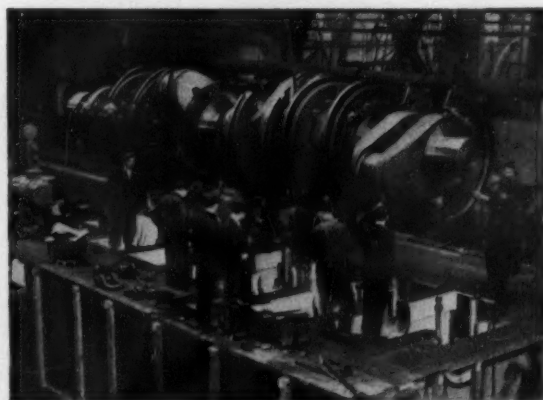
The N.E.M.-Göta-verken engine on the test bed at the Wallsend Works of North Eastern Marine Engineering Co Ltd

in cast iron while the upper part is in cast steel. All the valves are housed in the lower portion and the two parts, together with the exhaust valve housing, bolt into one unit with four heavy bolts.

The piston is of composite construction and comprises a heat-resisting steel head and a cast iron piston ring carrier. The piston is cooled with oil which is supplied through a telescopic pipe. The piston rod is of forged steel and bolted to the piston. The crosshead slipper is incorporated in the crosshead, and the lower half of the crosshead bearing provides one continuous bearing surface. The forged steel connecting rod is fitted with a white metal-lined cast steel big end bearing.

There is one fuel injection pump to each cylinder and they are operated on the jerk system in conjunction with two spring-loaded injectors in each cylinder, and actuated

(Continued on page 196)



Lowering the crankshaft, which is in two coupled parts, into position

Oil Topics

UNITED STATES OIL DEMAND FORECAST

FORECASTING supply and demand for oil in the U.S.A. for 1961, the Bureau of Mines makes three assumptions: that general business activity will improve in the third quarter of 1961, that weather conditions will be normal during the year, and that no overall change in crude oil stocks will take place. Thus, it expects total oil demand to average 10,054,000 barrels per day, an increase of only 1.7 per cent over 1960. This embraces a 4.4 per cent decline anticipated for exports to 195,000 b/d and a gain of 1.8 per cent in domestic demand put at 9,859,000 b/d. The required new supply of all oils in 1961 is forecast at 9,983,000 b/d, of which domestic production will furnish 81.9 per cent compared with 81.4 per cent in 1960. Domestic crude production for 1961 is estimated at 7,210,000 b/d, an increase of 2.7 per cent over 1960. Unless there are any changes in the import quota, imports of crude oil are put at 1,023,000 b/d during the year, a slight fall of 0.5 per cent or 10,000 b/d from 1960. Imports of finished products in 1961 will also remain virtually stationary and are estimated at 783,000 b/d, compared with 788,000 b/d in 1960. In respect of demand, experience in the U.S. this year will thus be much the same as in 1960. The American Petroleum Institute estimates it rose 2 per cent last year, a rate of gain substantially smaller than the 4 per cent rise expected at the beginning of the year and also below the 3.24 per cent rise recorded in the previous year. Domestic demand was up by 2.1 per cent over 1959 as compared with a gain of more than 4 per cent experienced in 1959 compared with 1958.

Revised Tanker Rate Schedule

THE Association of Ship Brokers & Agents, 8-10 Bridge Street, New York, has published a completely revised second edition of the *American Tanker Rate Schedule*, a worldwide guide to tanker chartering rates. An estimated 16,000 rates have been worked out over a two-years period for the new volume, which replaces the first schedule issued in December 1956, according to George J. Hartung, chairman of the Tanker Committee. The original rate schedule has been "universally accepted as far as American domestic charters on a worldwide basis," Mr. Hartung stated. It replaced the old Maritime Commission rate schedule. It is further intended in the near future to consider the need, if any, of increasing the average size of tanker used for these rates. The 16,600-dwt war-built T-2 type tanker was used as the basis for rate computations. An average service speed of 14.25 knots on 285 barrels of fuel oil per day was accepted as the basis for calculations. The formula used saw the establishment of all rates on the basis of full cargoes. The Tanker Committee is one of 14 acting under the framework of the Association of Ship Brokers & Agents, a national organisation whose membership includes about 90 per cent of the shipbrokers and agents in the United States. James J. Smith, of J. H. Winchester & Co, is president.

Higher Prices for Diesel Oil

THE British Mexican Petroleum Co Ltd has announced increases in the bunker spot price of marine diesel fuel and marine diesel medium fuel (gas oil) of 6s and 12s per ton respectively at sterling ports in the Western ranges. The higher prices, which took effect on February 8, apply to all ports in the United Kingdom, Scandinavia, North and West Europe, the Mediterranean, Africa (Casablanca to Lagos inclusive) and the Atlantic Islands. The last change in the price of these fuels at these areas took place on 15 February 1960, when marine diesel was cut by 2s

and marine diesel medium by 5s 6d. However, exactly one month before that the price of the two fuels had been raised by 6s 6d and 11s 6d respectively. The spot price of marine diesel fuel at United Kingdom installations is now 236s per ton and of marine diesel medium fuel 272s 6d. The company also announced that the bunker spot price of marine diesel medium fuel had been increased by 21 cents per barrel to \$4.81 at New York, Baltimore and Norfolk, and to \$4.48 at New Orleans.

RECENT SHIP SALES

REFRIGERATED cargo and passenger steamers *Changte* and *Tai ping* (4,324 grt, 2,580 nrt, built by the Hong Kong & Whampoa Dock Co Ltd in 1925 and 1926 respectively) sold by Australian-Oriental Line Ltd to Hong Kong shipbreakers for £18 10s per ton on the light displacement.

Motorship *Milora* (12,750 dwt, 8,678 grt, 5,209 nrt, built Oskarshamn Varv A/S 1958) sold by Skibs A/S Skytteren & Skibs A/S Matros (Yngvar Hviistendahl), Tonsberg, to the Bharat Line Ltd, Bombay, for £710,000 with March delivery at a Continental port.

Cargo steamer *Mount Othrys* (ex-*Othrys*, ex-*Fort Bedford*, 10,384 dwt, 7,050 grt, 4,343 nrt, built Vancouver 1943 by Burrard Dry Dock Co Ltd) sold by San Felicia Cia. Nav. S.A., Monrovia, to Hong Kong buyers for £94,000.

Cargo steamer *Arendsdijk* (ex-*Patagonia Victory*, ex-*Rollins Victory*, 10,800 dwt, 7,639 grt, 4,531 nrt, built Baltimore 1945 by Bethlehem Fairfield Shipyard) sold by Holland Amerika Line to British Colonial buyers for over £150,000 with March delivery at a Continental port.

Cargo steamer *Beteigeuze* (ex-*Welsh Trader*, 9,300 dwt, 4,929 grt, 2,778 nrt, built 1938 by J. L. Thompson & Sons Ltd) sold by "Orion" Schiff.-Ges. Reith & Co, Hamburg, to Hong Kong buyers for £89,000.

Cargo steamer *Fanad Head* (8,382 dwt, 5,033 grt, 2,883 nrt, built Belfast 1940 by Harland & Wolff Ltd) sold by Ulster S.S. Co Ltd to Wallem & Co, Hong Kong, for £87,500.

Cargo steamer *Slitan* (ex-*Edward Jansen*, ex-*Marandellas*, ex-*Sea Minstrell*, ex-*Empire Elgar*, 4,530 dwt, 2,932 grt, 1,694 nrt, built 1942 by Wm. Gray & Sons Ltd) sold by Skibs A/S Karlander, Fredrikstad, to Far Eastern buyers for about £90,000. She is already trading in Eastern waters.

Cargo steamer *Vaika* (ex-*Granada*, ex-*Kalfond*, ex-*St. Roch*, 1,791 grt, 1,068 nrt, built Sunderland 1922 by Osbourne Graham & Co Ltd) sold by Cia. Maritima Virona S.A., Panama (Liberian flag), to shipbreakers, reported to be in Spain.

Motor tanker *Diloma* (8,146 grt, 4,767 nrt, built 1939 by Cammell Laird & Co Ltd) sold by Shell Tankers N.V. to Belgian shipbreakers for about £69,500.

Tank steamer *Manco Copac* (ex-*Flisvos*, ex-*British Trader*, 4,204 grt, 2,314 nrt, built by William Beardmore & Co Ltd in 1921) sold by Nueva Peruana del Pacifico S.A., Callao, to Belgian shipbreakers for £14 per ton light displacement.

Diesel-electric tanker *Nayade* (ex-*Atlantic Belgium*, ex-*Permian*, 8,890 grt, 5,728 nrt, built 1931 by Scotts' Shipbuilding & Engineering Co Ltd) sold by Soc. Anon. Maritime et Commerciale, Panama, to German breakers for about £50,000.

Cargo steamer *Mangen* (2,190 dwt, 1,563 grt, 751 nrt, built 1946 by Helsingborgs Varvs A/B) sold by O. F. Ahlmark & Co Eftr. A/B Karlstad, to Swedish buyers for £70,000 and to be renamed *Nordano*.

GUEST, KEEN & NETTLEFOLDS LTD have taken over Holm-press Piles Ltd, who make bored concrete piles and build walls and jetties.

THE ALEXANDRA TOWING CO LTD has moved to Castle Chambers, 43 Castle Street, Liverpool 2 (telephone: Maritime 2151).

THE Paddle Steamer Preservation Society is to hold a special meeting on March 18 at 7.30 p.m., at Clwb y Cymry, above Studio One Cinema, Oxford Circus, London W1, to form a London and Home Counties branch. Election of officers and committee will take place and a provisional summer programme will be drafted. The society has Bournemouth/Southampton and Bristol Channel branches. It is hoped to form a Scots branch on the Firth of Clyde.

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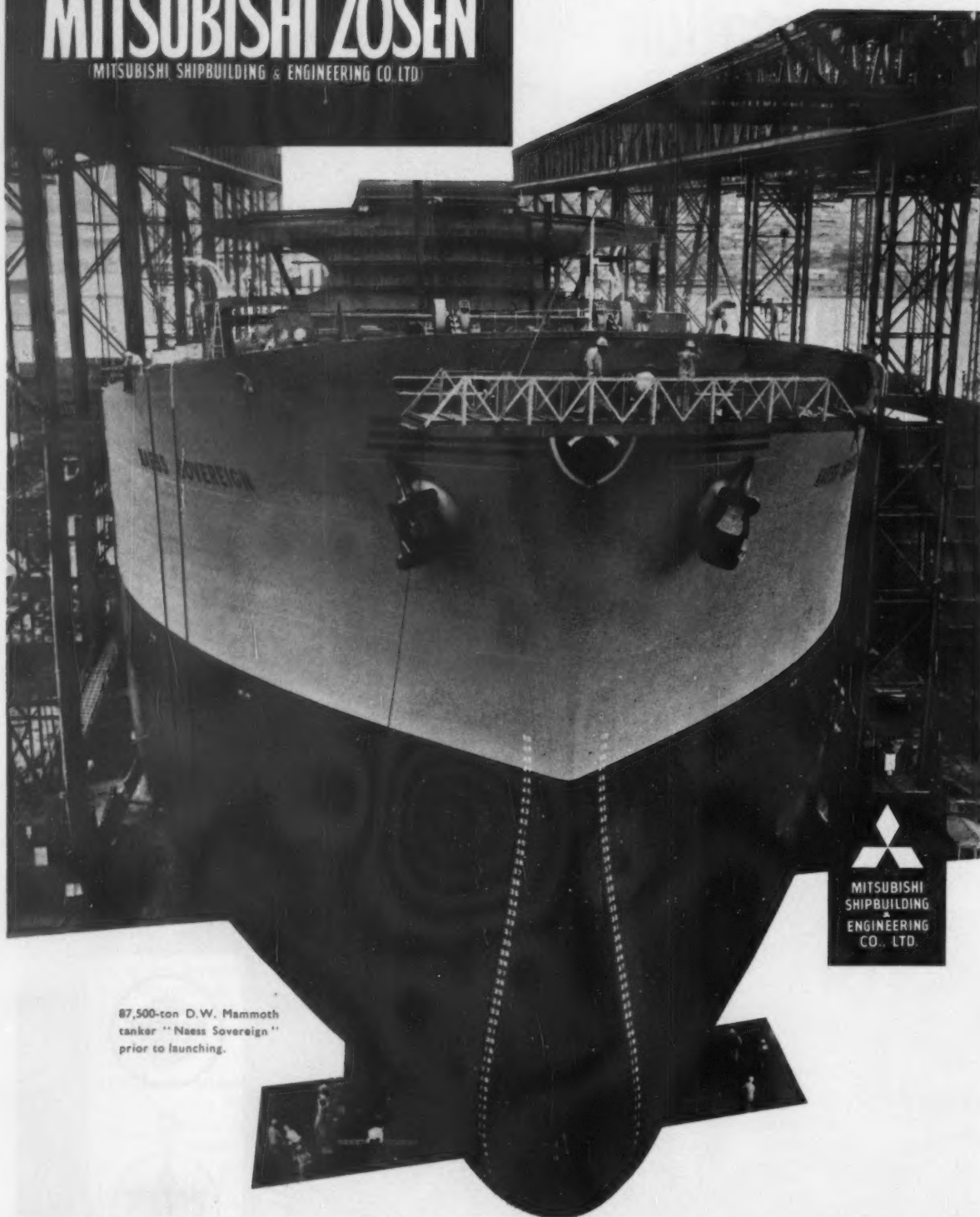


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87,500-ton D.W. Mammoth tanker "Naess Sovereign" prior to launching.



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The "Naess Sovereign"

LARGEST OIL TANKER UNDER THE BRITISH FLAG

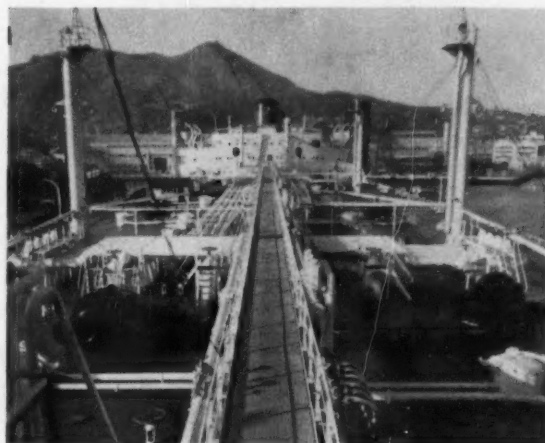
THE LARGEST oil tanker to sail under the British flag has been built by the Mitsubishi Shipbuilding & Engineering Co Ltd, Nagasaki. This vessel, the *Naess Sovereign*, 88,494 dwt, is the ninth vessel to be built by Mitsubishi for the International Naess Group, of which her owners, Anglo-American Shipping Co Ltd, Bermuda, are a member company. The new vessel is the third largest cargo vessel in the world, the largest merchant ship ever built by Mitsubishi, and the largest commercial vessel yet built in a Japanese-owned shipyard.

Anglo-American Shipping has already one tanker of 47,800 dwt in service, and also owns through subsidiaries the *Naess Clansman*, 25,850 dwt, the 27,966 dwt bulk carrier *Naess Pioneer*, and the 9,290-dwt ore carrier *Naess Trader*. All three ships are trading under long term charters. The *Naess Champion*, a sister ship to the *Naess Sovereign*, is now under construction at Nagasaki and is scheduled for delivery in June 1962. Both vessels have been chartered for 15 years to Stanvac, and are expected to trade primarily between the Persian Gulf, Australia and Manila.

A 37,000-dwt bulk carrier has recently been ordered by the Naess Group from Rheinstahl Nordseewerke, GmbH, Emden. The Group has now under construction or on order 51 ships amounting to nearly 2,000,000 dwt.

The keel of the *Naess Sovereign* was laid on 2 November 1959, and she was launched on 25 June 1960; she sailed on her maiden voyage to the Persian Gulf on 21 January. The ship, together with other vessels of the Naess group, is managed by Naess Denholm & Co Ltd, London and Glasgow, and manned by British officers and an Indian crew.

The *Naess Sovereign* has been built under special survey of the American Bureau of Shipping to their highest tanker classification and to meet all requirements of the British Ministry of Transport. With the exception of the

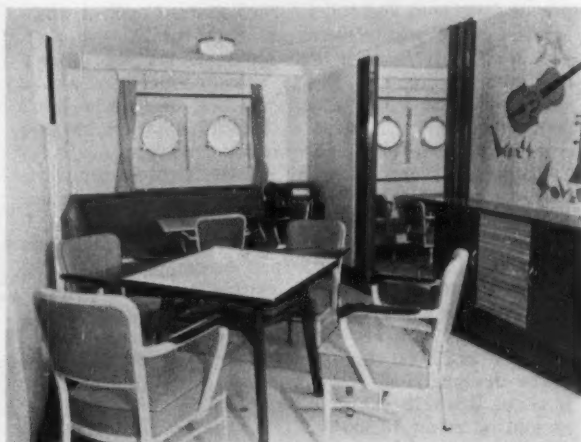


View from forward. Two automatic tensioning winches can be seen in the foreground

Principal particulars of the *Naess Sovereign* are:

Length o.a.	...	...	874ft 10in
Length b.p.	...	...	833ft 4in
Breadth, moulded	...	...	122ft 1½in
Depth, moulded	...	...	63ft 11¾in
Draught, summer freeboard	...	...	47ft 4¾in
Deadweight	...	...	88,494 tons
Gross tonnage	...	...	54,736 tons
Net tonnage	...	...	48,413 tons
Cargo capacity	...	...	4,200,000 cu ft
Machinery output (normal)	...	...	22,000 shp
Machinery output (max)	...	...	24,000 shp
Speed on trials	...	...	17.24 knots
Service speed	...	...	16 knots





1 Officers' messroom

2 Recreation room

3 Officers' smokeroom

4 Crew's smokeroom

riveted seams and doublers necessary to meet classification requirements the hull is entirely of welded construction. The vessel is longitudinally framed throughout the cargo spaces and transversely framed at the forward and after ends, and has a pronounced bulbous bow.

Large Cargo Pumps

Two oiltight longitudinal and ten transverse bulkheads divide the cargo space into 33 tanks which have a total capacity of about 4,200,000 cu ft. The cargo pump room, which is located immediately abaft the cargo tanks, is equipped with four steam turbine-driven horizontal single-stage main cargo pumps each of 2,000 tons/hour capacity (water); there are also four vertical duplex steam reciprocating stripping pumps each of 400 tons/hour capacity. The Golar Vent-dry system, described in *THE SHIPPING WORLD* of 18 March 1959, is used for ventilating and drying the cargo tanks to make them gas-free. The system comprises a turbine-driven blower located at the top of the pump room which delivers heated air through the cargo lines to any tank within the ship.

Fuel oil is carried in the forward deep tanks and in the after bunkers. The total bunker capacity is about 85,500 barrels, which is roughly equivalent to the cargo capacity of a 10,000-dwt tanker. Fuel is transferred through the deck bunker line from the forward tanks by means of a 240-tons/hr capacity fuel oil transfer pump located in the forward pump room. This pump room is situated directly forward of the cargo tank space, and

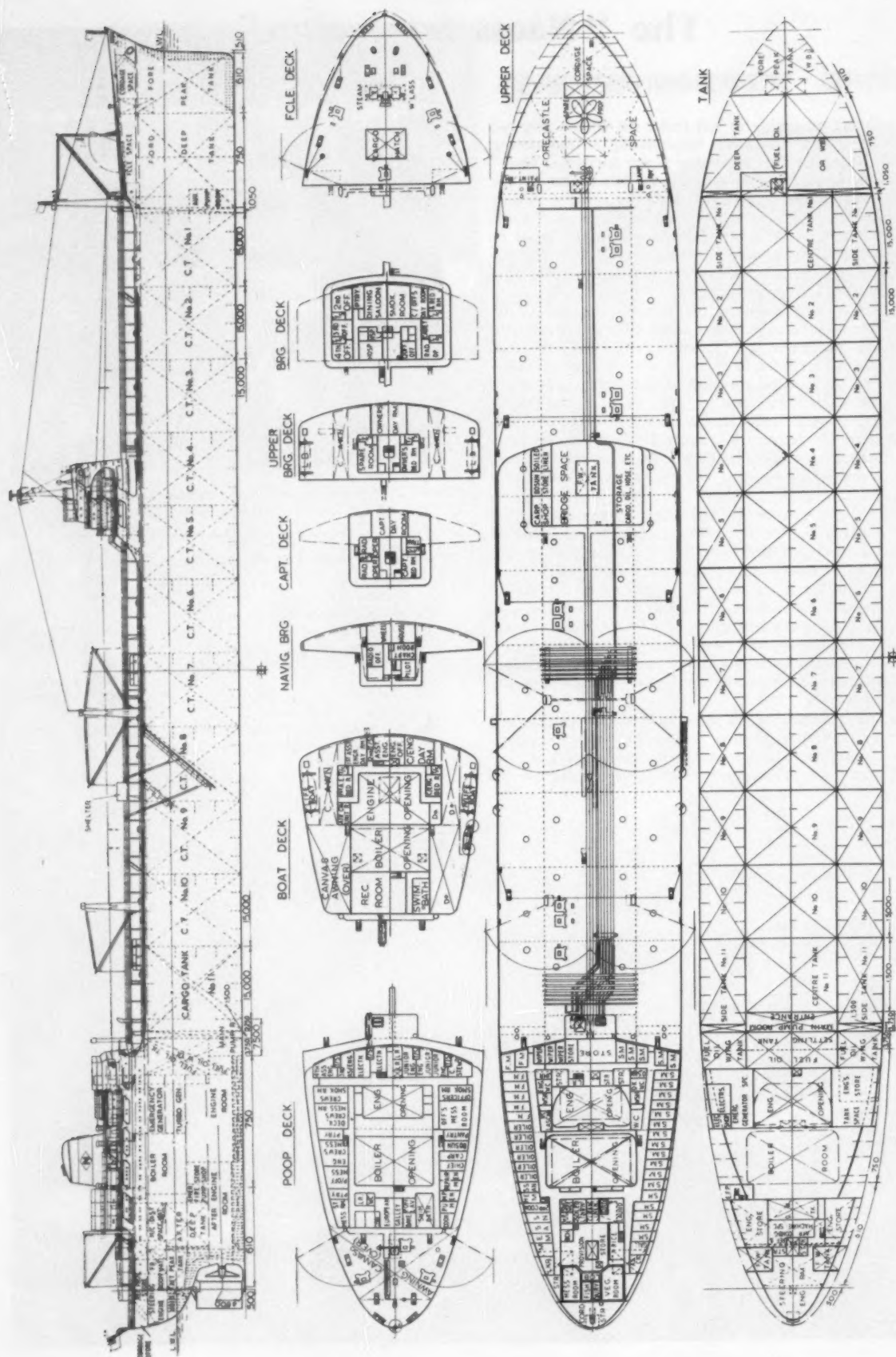
also contains a 160 tons/hr capacity bilge and ballast pump, which serves the forepeak tank, forward cofferdam and forward pump room bilges. The total fresh water capacity is about 1,400 tons, although since she is fitted with three salt water distilling plants capable of producing 12,000 gallons of fresh water per hour, it is not anticipated that this amount will be used.

The vessel is fitted with eight unstayed steel samson posts with steel booms. The booms serving the forecastle space have a capacity of 3 tons, while those for handling stores on the poop deck are of 2-tons capacity. On the after deck the booms serving the two cargo manifolds each has a capacity of 8 tons. This capacity is necessary in order to handle the 12-in cargo hoses used for loading and discharging safely and efficiently.

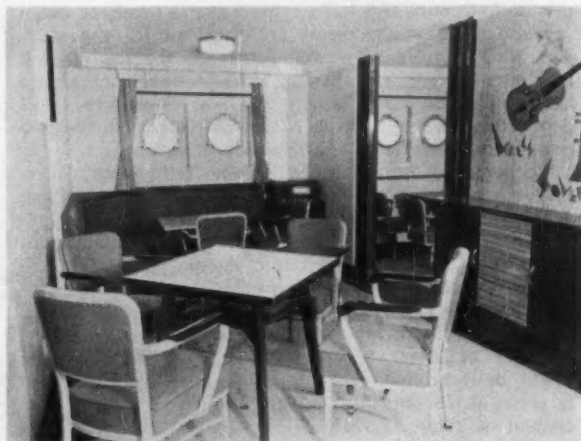
The vessel is fitted with steam-driven anchor windlasses both forward and aft for the handling of the two forward anchors and the after anchor. Eight automatic-tension steam mooring winches are fitted, two on the forecastle, two on the poop and four on the main deck. There are also three steam cargo winches, one on the forecastle head to serve the forward cargo booms and two on the main deck aft serving the hose-handling booms.

Accommodation

As the accompanying illustrations show, the accommodation is of a particularly high standard, and is air-conditioned with single-berth cabins for officers and most adult crew members. All officers have private or semi-



General arrangement of the oil tanker "Naess Sovereign", 88,494 dwt, built by the Mitsubishi Shipbuilding & Engineering Co Ltd, Nagasaki, for the International Naess Group



1 Officers' messroom

2 Recreation room

3 Officers' smokeroom

4 Crew's smokeroom

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private bathroom and toilet facilities, and excellent washing and toilet arrangements are provided for the crew. The *Naess Sovereign* is well fitted out for the officers' and crew's recreation, having a swimming pool and a large recreation room which will seat the entire ship's complement when used as a cinema. Both officers and crew have comfortable and spacious smokers' rooms.

The vessel is propelled by a Mitsubishi-Escher Wyss cross-compound double-reduction geared steam turbine driving a single five-bladed propeller. The normal output is 22,000 shp at 102 rpm, and the maximum continuous rating is 24,000 shp at 105 rpm. Steam pressure at the turbine throttle is 825 lb/sq in and steam temperature at the throttle is 892 deg F. The designed main condenser vacuum is 722mm Hg with a sea water temperature of 74 deg F at 22,000 shp.

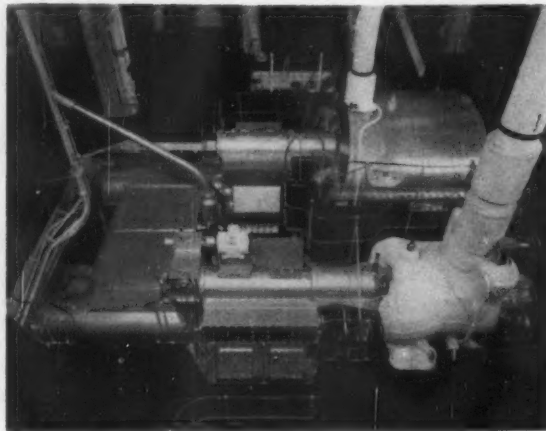
The designed fuel rate for all purposes at 22,000 shp is about 0.518 lb/shp-hr when burning oil with a heat content of about 18,500 BTU/lb. The sea trial fuel consumption was somewhat lower than the designed rate.

The main turbines are of the all-impulse type and consist of a high-pressure turbine and a double-flow low-pressure turbine. The astern unit is incorporated in the after end of the low-pressure turbine, and is designed to develop 80 per cent of the normal ahead torque at 50 per cent of the normal ahead rpm with a steam flow not greater than that required for normal ahead power. The LP turbine exhausts into a single-pass surface condenser located beneath the turbines.

Three Mitsubishi-Combustion Engineering two-drum bent-tube type boilers are fitted. These are arranged for burning oil under forced draught and are fitted with superheaters, desuperheaters, waterwalls, extended surface economisers, steam air heaters and automatic combustion and feed water controls. Any two of the boilers have sufficient capacity for operating the vessel at normal speed while heating cargo. The steam pressure at the superheater outlet is 850 lb/sq in and the temperature 900 deg F.

Forced draught is supplied by three motor-driven blowers located in the engine room with air ducts arranged so that each blower can serve any of the three boilers. There are four turbine-driven horizontal two-stage centrifugal feed pumps, any one of which has sufficient capacity for full power operation.

A closed type boiler feed and condensate system is used. Condensate from the main and auxiliary condensers is pumped through the drain cooler, first stage heater, air ejector, inter and after condensers into the deaerating feed heater from which it flows to the feed pump suction. The first stage heater is supplied with heating steam from an extraction connection in the LP turbine. Steam to the deaerator is supplied from the exhaust crossover pipe between the HP and LP turbines, while an additional con-



View looking down on the compact Mitsubishi-Escher Wyss 22,500-shp turbine installation

nection in the HP turbines supplies bled steam to the air heaters. All engine room drains are collected into a tank from which they are pumped to the deaerator shell.

Electric power is supplied by two main turbo-generators, each of which has a normal output of 1,250 kVA/1,000 kW. Current is generated at 450 volts AC at a frequency of 60 cycles. The generators are of the totally enclosed type and are fitted with water-cooled air coolers. A diesel-driven emergency generator is also installed in the engine room. Its rated normal output of 400 kVA/320 kW at 450 volts 60 cycles is sufficient to supply power for emergency lighting and essential propulsion auxiliaries for ship operation at about half normal power. Three-phase current at 450 volts is supplied for all power requirements, while 220-volts three-phase power is supplied to galley ranges; 110-volts single-phase power is supplied to all lighting circuits and miscellaneous small items of machinery.

BRITISH-BUILT GÖTAVERKEN ENGINE

(Continued from page 191)

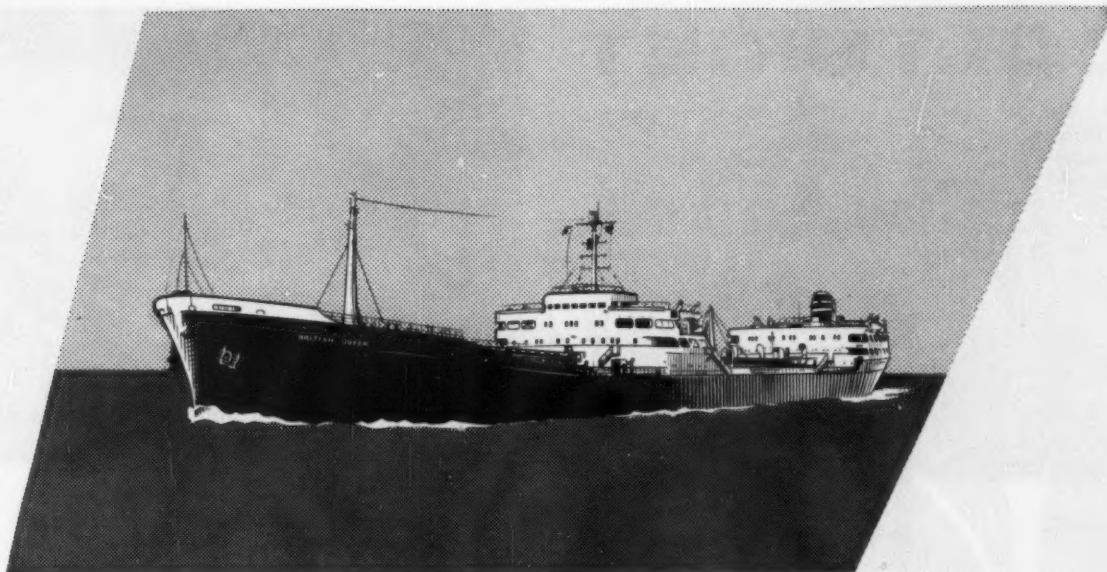
by a camshaft which is chain-driven from the crankshaft. The exhaust valve is centrally-located in the cylinder cover.

The uniflow system of scavenging is used, air entering the ports at the lower end of the cylinder and exhaust gas leaving through the exhaust valve in the top of the cylinder cover. Exhaust gas is passed at constant pressure to the turbocharger from the main engine cylinders. The air from the compressor is discharged through an air cooler to the external scavenge air receiver. It is then displaced through valves into the main scavenge air receiver by means of small reciprocating scavenge pumps operated from the engine crosshead.

The fuel consumption of the N.E.M.-Götaverken engine at full load is 0.36 lb/bhp-hr when using marine diesel oil having a gross calorific value of 19,300 B.T.U./lb. Engine outputs range from 2,500 bhp at 160 rpm to 22,000 bhp. The higher output is obtained from the latest 850-mm bore engine described in THE SHIPPING WORLD of 30 November 1960.

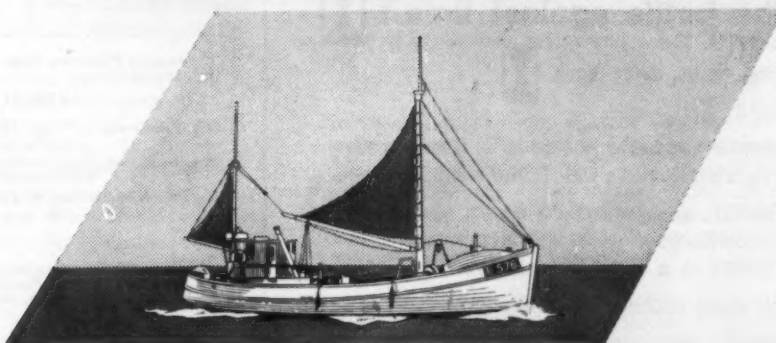
THE FOWEY HARBOUR COMMISSIONERS have assumed the responsibility for towage services in Fowey Harbour. They have acquired the steam tug *Tolbenny* from the Fowey Tug Co Ltd, and the service will be operated by this vessel and the steam tug *St Canute* (ex *Othonia*) which was recently bought from Denmark.





SS BRITISH QUEEN

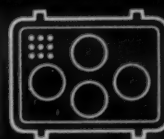
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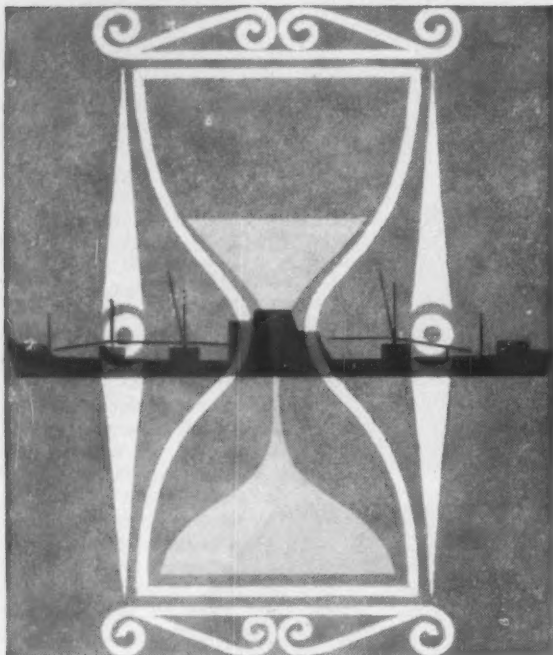
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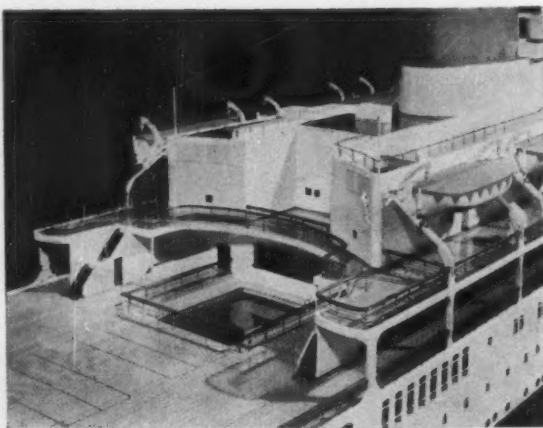
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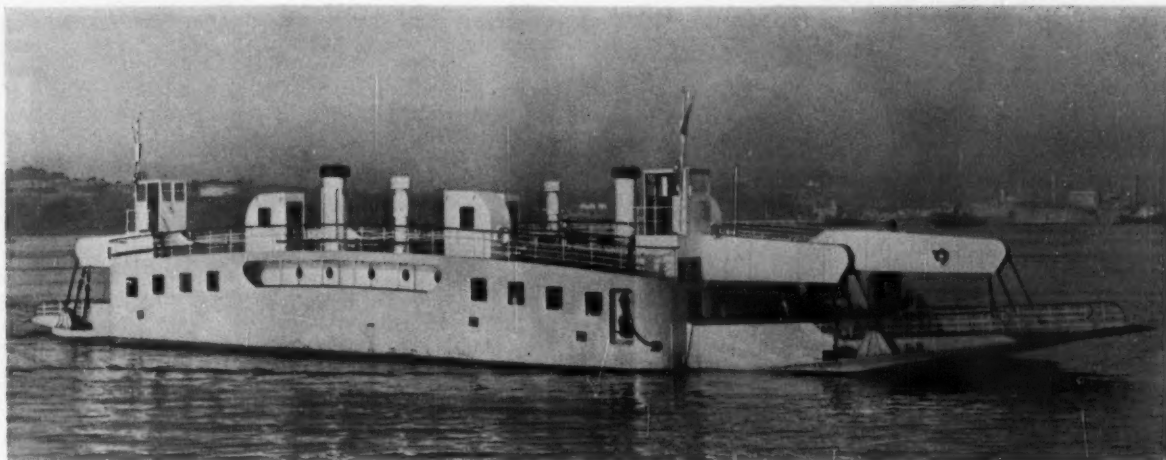
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Diesel-Electric Chain Ferries

REPLACEMENTS FOR STEAM FERRIES AT TORPOINT

THE FIRST of the two diesel-electric chain ferries which were ordered by the Cornwall County Council for operation between Devonport and Torpoint has now entered service. These craft have been built at the Southampton shipyard of John I. Thornycroft & Co Ltd, to the design of Graham & Woolnough, consultants to the Cornwall County Council, and were ordered as replacements for the existing steam ferries. They will normally operate a 15-minutes service between the two sides of the river Tamar, and by virtue of their greater capacity should reduce the long delays experienced by motorists on this crossing.

These ferries, powered by electrical machinery supplied by the General Electric Co Ltd, have been designed primarily to carry vehicles, while also providing accommodation for a large number of passengers. So that long-wheelbase vehicles such as motor coaches may embark and disembark fully laden, special attention has been given to the hinged prows, and wheelboards are not required.

The electrical installations in the two ferries are identical, each consisting of a propulsion motor, three tandem diesel generating sets, a 10-kW standby generating set and a number of motors driving auxiliary equipment.

The new ferries have the advantage that they are of increased carrying capacity, which is most important since they form a half-mile link in the A.38 road between Exeter and Bodmin. Each ferry can carry about 36 average-size motor cars, and has faster loading and unloading facilities, including the fitting of the 40-ft long rising and falling prows.

Principal Particulars

Length overall	182ft
Length of hull	102ft
Length of each prow	40ft
Breadth of hull	54ft
Breadth of traffic deck	32ft
Depth of traffic deck at centre	9ft 6in
Depth of main deck at side	10ft
Depth of upper deck at side	18ft
Draught, loaded	5ft 9in
Speed (with two generators)	630ft/min
Speed (with one generator)	440ft/min

Control is from any one of three positions: two cabins, one at each end of the deck, and the engine room.

There are two chain wheels, one on each side of the ferry, and these are driven through a 500:20 rpm gearbox by a G.E.C. 440-volts, 250-hp separately-excited electric motor running at 500 rpm. Power Plant disengaging



Vehicles leaving the ferry on the Plymouth side of the river



The engine room, showing one of the chain wheels and one of the worm drives for the prop operating gear

gear tooth-type sliding couplings are fitted on each side of the gearbox output shaft so that the 10½-in diameter main shafts driving the chain wheels may be disconnected if required. Also fitted in the main shafting, one on each side of the gearbox, are two Croft's 45-in Multiflex couplings.

The Ward-Leonard speed control system for the propulsion motor provides seven steps of speed in either direction. Maximum power for the motor is obtained from any two of the three generating sets, which are driven by identical National type N.M.H.8 horizontal diesel engines. Each diesel engine drives in tandem a 114-kW 220-volts DC main generator and a 35-kW 220-volts DC auxiliary generator. The three 114-kW generators provide the power for the propulsion motor, and the 35-kW sets supply the auxiliary machinery, lighting, heating and the excitation for the main machines.

Only one main generating set is used for normal service, with the second as a standby; the third set is then available for maintenance and overhaul. Interlocks are fitted

to prevent more than two of the three generators being connected to the propulsion motor at any one time. These interlocks take the form of solenoid-operated locks fitted on the respective generator isolators so that when two of the isolators are closed, the third is locked open. An underspeed relay is fitted to each diesel generating set so that if its speed falls below a preset value, the relay operates to remove it from the system. This prevents motorizing of the generator should another set be running.

With the three-field generator system of speed control fitted, it is impossible to overload the propulsion motor by mishandling the controllers. Should the handle of a controller be moved too fast the current in the armatures of the generators and propulsion motor would tend to rise unduly. This current passes through the series fields of the generators in circuit and exerts a demagnetising influence on the excitation systems, thus preventing overloading of the system.

As a final protection against possible electrical failure an overload coil is included in the propulsion motor loop. It is set well above the normal working currents of the system and is arranged to trip the contactor supplying the main excitation circuits of the motor and generators.

Auxiliary Generator Switchboard

The three 35-kW auxiliary generators and a 10-kW standby generating set feed, through a seven-position switch, a double-busbar switchboard. Switching arrangements are such that under no circumstances can the 35-kW generators be paralleled either with each other or with the standby set.

One 20 hp electric motor serves both prows. It is coupled to a 900/110 rpm worm reduction gearbox which incorporates emergency hand turning gear. Shafting from either side of this gearbox is then connected to 10 hp, 110/11.2 rpm worm gearboxes operating the prows.

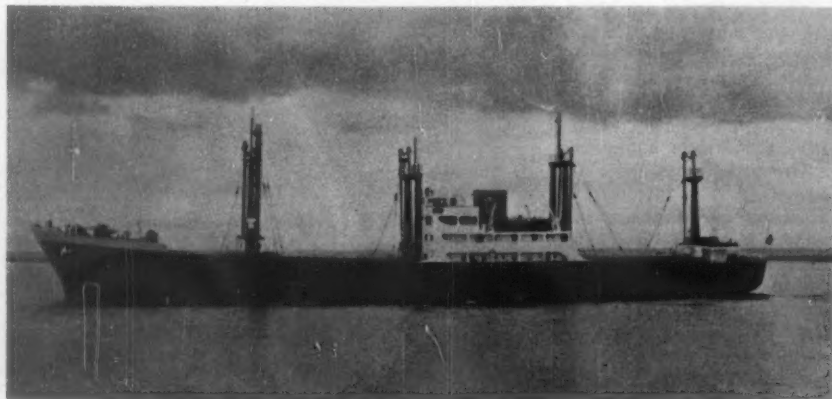
A 16-hp Clarke, Chapman electrically-driven capstan is installed to assist in the maintenance of the main gu'ding chains, and is capable of a direct pull from the barrel on the traffic deck of 2½ tons at 60ft/min, and with a slack rope speed of 130ft/min. The motor and worm gearing for this capstan are situated below the traffic deck in the machinery space. In order to make the capstan portable, the vertical shaft is arranged with couplings.

THE "NOTRE DAME D'AFRIQUE"

A SMALL high-speed cargo liner has been built in France specially for the service between Marseilles and Oran. This vessel, the *Notre-Dame d'Afrique*, 3,500 dwt, has been built by the Anciens Chantiers Dubigeon, Nantes, for the Société Algérienne de Navigation, Charles Schiaffino & Cie. This ship has a bulbous bow and on trials exceeded 19 knots; this enables her to make the journey from Marseilles to Oran in 30 hours.

Cargo is carried in three holds, one of which is refrigerated. The holds are covered by Ermans rolling type hatch covers. The vessel has 30 wine tanks with a total capacity of 7,520 hectolitres. The ship is 328ft overall in length and has a moulded breadth of 47ft 6in and a draught of 22ft 7¼in.

The *Notre-Dame d'Afrique* is powered by two SEMT-



Pielstick diesel engines each of 2,800 hp output at 420 rpm. These engines drive a single variable-pitch propeller at 200 rpm through reduction gearing and hydraulic couplings. Electricity is supplied at 180 kW 220 volts by three M.A.N. diesel generators.



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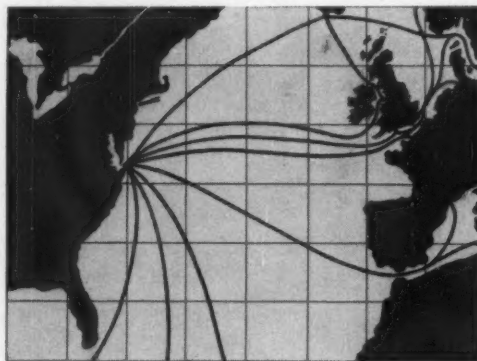
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Machinery for 65,000-Tons Tanker*

DESIGN AND LAYOUT OF 22,000 SHP MACHINERY INSTALLATION

By J. B. Main

THE INTENT of this paper is to outline an approach which has been made to the design and layout of the machinery in a 65,000-tons deadweight tanker. The specification aimed at the provision of nothing exceeding bare adequacy in the number and complexity of auxiliary units, because it was felt that the balance of capital cost, fuel cost and probable maintenance and repair costs, should be biased substantially in anticipation of a continued rise in the cost of repair yard labour throughout the life of the ship.

The following assumptions have been made in assessing the economic logic of the design:

- (1) Oil fuel cost—£6 per ton.
- (2) 320 days per annum in the life of a tanker operating Middle East/N.W. Europe are spent under way at sea.
- (3) Capital charges representing amortisation, insurance and service of finance are of the order of 14 per cent of the initial investment. In other words, the expenditure of £1,000 on any machinery item saddles the vessel with an annual capital charge of £140. Where the anticipated effect of such expenditure is an improvement of plant performance it follows that the amount of the improvement must not be less than will yield £140 per annum reduction in operating cost (for example in the fuel bill).

Choice of Steam Condition

There is no completely certain approach to the determination of the optimum steam condition. One might say that for an engine of this power the choice of pressure lay between 600 lb/sq in gauge and 900 lb/sq in gauge and the choice of temperature between 850 deg F and 1,100 deg F. The lower limits of 600 lb/sq in gauge/850 deg F would be suggested by the now substantially proven performance of many steam turbine installations built in the last ten or twelve years. The upper limits are extremely difficult to assess. In considering the use of steam at say, 1,100 deg F, the sharp rise in capital cost due to the introduction of austenitic steels for pressure parts subject to the maximum steam temperature is perhaps less difficult to justify than is the acceptance of the relatively unknown degree of risk of severe maintenance trouble which could be encountered with the superheater elements of the boilers.

The pressure was pegged at 600 lb/sq in gauge because the incidence of pipe joint and valve leakage in recently built new tonnage had not suggested that higher pressure could justifiably be adopted. Conceding that satisfactory experience is now being gained with welded pipe connections and with valves and fittings manufactured by specialists, it was decided to use those advanced techniques as additional insurance against steam and feedwater leakage rather than to push the design operating pressure to a practical limit.

It is apparent also that in boilers designed for pressures higher than 600 lb/sq in gauge tube failures due to internal deposits can become much more prevalent unless pre-commission cleaning of the circuit, and subsequent feedwater quality control of an order somewhat higher than the average practice obtaining, is ensured. Steam temperature was decided at 900 deg F, principally because it was felt that beyond this figure the onset of corrosive attack on the superheater elements and their supports by vanadium ash, and more serious superheater slagging difficulties, could be expected.

So much, then, for the reduction in fuel rate which could have been won by the adoption of more advanced initial steam conditions. 600 lb/sq in gauge/950 deg F would have improved the fuel rate by about 2 per cent or 2½ tons of fuel a day. A pressure advance to 850 lb/sq in gauge coupled with 850 deg F temperature would have yielded about one ton a day saving. 850 lb/sq in gauge/950 deg F would have reduced the fuel rate by 5 tons a day.

It is well known how rapidly the penalties payable for any sacrifice of reliability can operate to restrict the savings indicated by these estimated improvements in fuel rate. In the complex which goes to make up a seagoing machinery installation there is undoubtedly more scope for real advance by consolidating and rationalising designs at the present level of steam conditions than by moving prematurely into advanced pressure and temperature cycles.

The decisions to adopt non-condensing turbogenerators and a steam turbine drive for the single main circulating pump have fundamental influence upon the final shape of the system, and justification of these decisions is shown later in the paper. The boiler feed and the main and auxiliary steam systems are shown in the form of a flow diagram in Fig 1 which has been detailed to include all information likely to prove of interest.

Main Boiler Plant

A twin main boiler installation has become virtually standard practice in tankers up to the largest sizes now building and experience has indicated that such an arrangement provides adequate security and flexibility of operation. It was felt that total elimination of economiser and superheater element end leakage in way of their connections to the headers could be achieved by suitable all-welded designs.

The cargo discharge performance required called for an installed pumping capacity of about 6,000 tons of 0.9 SG crude oil per hour against a discharge pressure of 150 lb/sq in gauge at the pumps. It was desirable also that in the event of one boiler being shut down, the remaining boiler should be able to maintain a cargo discharge rate very close to the 6,000 tons/hr figure. The total desuperheated steam load when the four cargo pump turbines are operating at maximum power is about 100,000 lb/hr. The maximum evaporation rating of each boiler is 95,000 lb/hr.

Surface type desuperheaters were known from previous designs to approach the limit in terms of their reasonable accommodation within the drums at around 80,000 lb/hr throughput capacity, even when allowing extremely high steam speeds in the desuperheater tubes. Moreover, difficulties of desuperheater tube wastage, particularly at the hot end, with internal surface designs were not unknown, and insuring positively against boiler water leakage into the desuperheater through internal joint connections has always been a problem.

The decision was therefore taken in this case to adopt spray desuperheating equipment and to depend on this equipment entirely for all desuperheated steam requirements. Whatever problems this may have introduced elsewhere it certainly simplified the boiler plant.

The funnel gas temperature and hence the boiler efficiency to be aimed at involves balance of the cost of the flue gas heat recuperation equipment and its weight, bulk and probable maintenance difficulties on one hand and the expected reduction in fuel rate on the other.

The decision to use non-condensing type turbogenerators in this case directed the boiler design toward the adoption of steam air heaters and, in consequence, toward flue gas heat recuperation plant in the form of economisers.

Forced Draught Fans

The preliminary study indicated that the fan motor power on each boiler would be about 140 bhp. The choice open in AC motor speeds for flexibility of control was considered at some length. AC motor fan speed variation in the majority of recent steamships tended toward the adoption of pole-changing motors, usually giving, say, two speeds approaching any selected pair in the 600/900/1,200 or 1,800 rpm series for 60 cps power supply. In some cases the motors are wound for two adjacent speeds with the intention that the lower speed fan output matches normal boiler evaporation and the higher speed provides for maximum evaporation. In other cases the

* Abstracts of a paper read to the Institute of Marine Engineers on 14 February 1961. Mr J. B. Main is Deputy Head of New Construction, Shell Tankers Ltd.

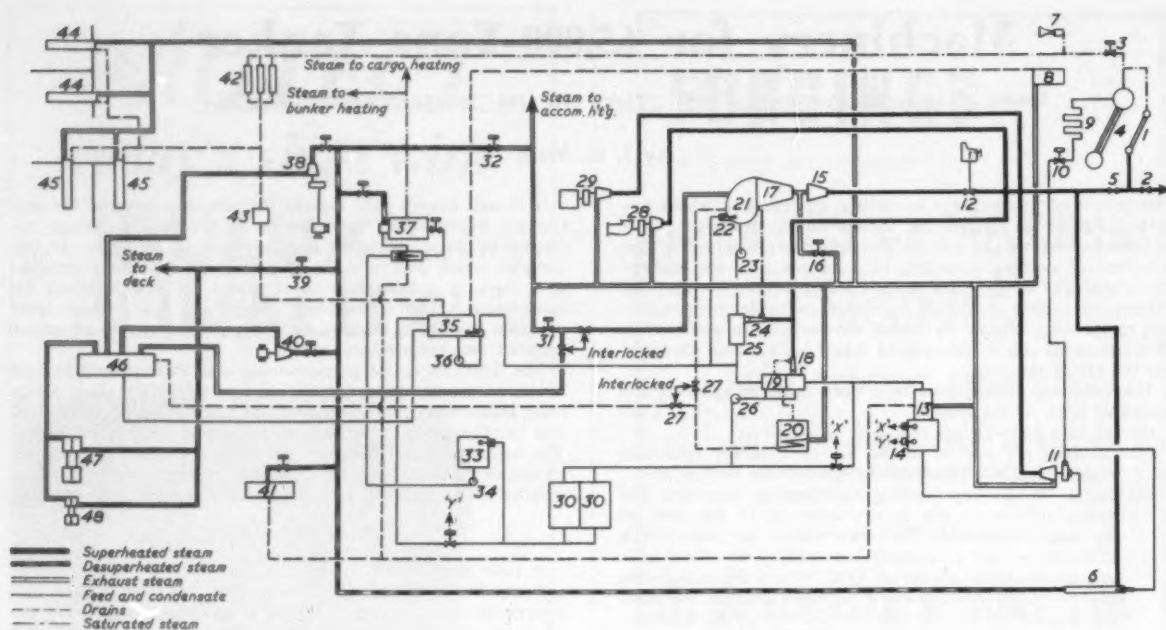


FIG 1 Flow diagram

- | | | | |
|------------------------------|-----------------------------|---------------------------------|--------------------------|
| 1 Superheater | 13 Deserator | 25 Ejector and gland condensers | 37 LP steam generator |
| 2 Steam to sootblowers | 14 Level controls | 26 Evaporator condensate pump | 38 Cargo pumps |
| 3 Saturated steam controller | 15 HP turbine | 27 Evaporator coil drain | 39 Deck steam controller |
| 4 Main boiler | 16 Bleed controller | 28 Main circulating pump | 40 General service pump |
| 5 Main steam stop | 17 LP turbine | 29 AC generator | 41 Sea water heater |
| 6 Desuperheater | 18 Evaporator air ejector | 30 Distilled water tanks | 42 Oil fuel heaters |
| 7 Whistle | 19 Evaporator condenser | 31 Surplus exhaust controller | 43 Condensate filters |
| 8 Air preheater | 20 LP evaporator | 32 Exhaust make-up controller | 44 Sett. tank heaters |
| 9 Economiser | 21 Main condenser | 33 Steam gen. feed tank | 45 Bunker heaters |
| 10 Feed regulator | 22 Recirculation controller | 34 Steam gen. feed pump | 46 Atmospheric condenser |
| 11 Main feed pump | 23 Main extraction pump | 35 Atmospheric drain tank | 47 Cargo stripping pumps |
| 12 Main throttle | 24 Main air ejector | 36 Drain tank extr. pump | 48 Fuel transfer pump |

motor pole selection may be four and twelve to give low speed, reduced fan power and greater stability of air control under harbour steaming conditions.

Both of these approaches were considered in this case and it was felt that neither offered the complete answer. On the first count the operation of the main boilers in a tanker at maximum rating for prolonged periods is rarely justified and hence the high speed winding is seldom used. In the second place, steam loads in harbour, especially at the discharge terminal, can fluctuate very widely indeed as cargo pump units are cut in or are shut down. The question then was whether it was not worthwhile to avoid the expense and complication of two speed motors and switchgear by adopting single-speed fans controlled only by inlet vanes. Fluid couplings were investigated as an alternative to inlet vanes for the purpose of varying fan output. It was apparent that the standard fluid coupling could provide an output speed turn-down of about 5:1 and that adjustable radial inlet vanes were capable of providing a greater turn-down of fan output. Admittedly the fluid coupling could offer savings in driving power during conditions of low boiler steaming rates. It was felt however that such consideration was by no means decisive and vane-controlled fans driven by single-speed four-pole motors were decided upon.

The FD fan capacity eventually decided was 32,000 cu ft/min against 20in WG. This represents a head margin of 140 per cent over the clean resistance of the generating, superheater and economiser tube banks at maximum evaporation rate and with 13 per cent CO₂.

Propulsion Turbines

The Pametrada double-casing HP turbine was accepted on the ground that it offered a design having an efficiency comparable if not marginally better than any other marine turbine design available. When it is uncomplicated by primary nozzle sub-groupings, initial stage bypass or steam extraction branches,

this turbine should, given the necessary care in construction and installation, provide a fully reliable unit.

The engine specification required that the propulsion turbine and the gear unit should produce 22,000 shp at 108 rpm with a steam condition of 570 lb/sq in gauge 880 deg F at the HP turbine inlet, with a main condenser vacuum of 29in Hg and when no steam is bled from the HP exhaust to supplement the auxiliary exhaust range. Spring-back casing gland and diaphragm labyrinths are fitted throughout the HP turbine and spring-back glands are provided at each end of the LP turbines.

In assessing the relative performances of contending turbine designs, it is, as in all such comparisons, essential that account is taken of how the performance is reached. An example of this is the effect of the astern elements on the ahead running efficiency. In this particular design, in common with widely adopted British practice, the HP astern element is carried on an extension of the HP ahead rotor. This allows the development of astern power on both rotors and its transmission through both gear trains; astern power up to about 60 per cent of the full ahead power can thus be provided. If astern power of this order is essential, it must be appreciated that its provision entails a significant loss of performance when running ahead. The power dissipation in astern turbines as a percentage of the full ahead power, when running ahead, has been variously estimated at 1 per cent to 1½ per cent in each element, or say a total of 1½ per cent power loss in a design having astern provision on the LP rotor only and twice this amount for a design as used in this case. When it is remembered that in addition to windage loss on the astern wheels and blading, the inward gland sealing leakage to the HP astern cylinder in this case can only find its way to the condenser via the LP astern nozzles it is not difficult to believe that the total loss for this design could be as high as 650 hp. The penalty for carrying two astern elements for 60 per cent astern power may amount in

this case to an additional fuel consumption of some 1.2 per cent or 1.4 tons of fuel a day.

It had been found in earlier double-casing HP turbine design that any discrepancy in the inner casing locating key settings and clearances led inevitably to heavy rubbing of rotor packings, and special care was taken to ensure that the horizontal and transverse key clearances were strictly in accordance with the design. The loose elements of all keys were phosphated to ensure against binding due to the accumulation of corrosion debris.

Turbogenerators

The cycle adopted was conceived around the use of non-condensing generator turbines because it appeared evident from a study of the relative costs of condensing type and non-condensing type sets and their respective impacts on the cycle performance, that the better investment return would be obtained by using non-condensing, or back pressure type sets.

If condensing sets of equal kW rating had been fitted, the inclusion of an LP feed heater and operation of the evaporator from the same low pressure extraction belt on the LP turbine would have been logical. The resultant additional capital expenditure would have been about £16,500 and a direct increase in machinery weight of some 26 tons would also have resulted.

Future Possibilities

It may be of interest finally to consider some possible changes, consisting mainly of further pruning, to the design which has been described in the paper. An argument can be made for the provision of one astern turbine element only, say on the LP rotor. The resulting simplification of the HP rotor and the elimination of part of the power loss would be immediate and tangible gains. The application of full reverse power in an effort to stop the ship from full speed presupposes the propeller's ability to absorb this power, and it is known from experience that flow conditions into the propeller during the initial stages of an emergency stop, limit the astern rpm which can be usefully applied before cavitation and loss of astern thrust occur. The power absorption limit of the propeller under such conditions is probably between 35 and 40 per cent of the full ahead power and this can usually be obtained from a two-stage astern turbine on the LP rotor.

On the other hand the astern turbines in the design described should enable superior manoeuvring performance of the ship at the slow speeds obtaining under docking conditions. Here the propeller can operate astern more efficiently and higher astern power should result in better acceleration when required.

The improvement in propulsion efficiency resulting from a reduction in rpm from 108 to say 100 would be perhaps a little better than one per cent. The increased cost of the gearing and the propeller would be set against this but it appears that a net benefit would result from adopting lower rpm. However, large heavyweight propellers present real problems of transport and handling in the dock.

The provision of an auxiliary or emergency diesel set in addition to the two 600-kW turbo sets in the present scheme follows existing convention and the diesel generator undoubtedly is of value in facilitating "dead ship" starting and in drydock. A further vessel now building for the author's company will be equipped with a total electric power generating outfit of one steam turbine generator and one diesel set of equal (i.e. ship's full load) rating. The diesel set is regarded as the standby unit and the ship would be considered operational for the passage back to a home port in the event that the turbine generator became a casualty.

The net capital cost saving in a repeat ship of the class considered in this paper would be £14,000, using a 600 rpm pressure-charged diesel, and is recommended as further astringency in the design.

Provided any of the vital parts such as the heating elements, the brine and distillate pumps and the salinometer control can be quickly replaced by spares in the event of failure or overhaul necessity on the parts in use, it is reasonable that only one evaporator plant be installed. A capital cost saving of £8,500 would result.

Steam for Cargo Heating Coils

The steam/steam generator plant fitted in this design, and in many present day tankers, is a heavy and costly aggregate

of heat exchangers, piping and control devices, calling for its full share of maintenance. Cargo and fuel tank heating coil jointing techniques have much improved in recent years and if satisfactory observation facilities are provided, an occasional minor contamination in the returning drains should not be difficult to cope with.

It is agreed that the dangers of oil contamination of boiler feed and heating coil material pick-up by acid condensate and its return to the boilers in the drains, require completely effective safeguards. The capital cost saving of about £13,800 in dispensing with the steam/steam generator plant and its associated steam and feed pipe systems, however, is worth weighing against alternative means of protecting the main boiler tubes against the hazards of feed contamination.

Air Conditioning Coolant Source

It has been shown that a shortcoming of the back pressure turbogenerator cycle is the tendency for the build-up in tropical operating conditions of exhaust steam surplus to the offtake by the de-aerator, air heater and evaporator, due in part to the electric motor drive power for the air conditioning refrigerant compressors.

If means of providing accommodation space air cooling from the energy available in the auxiliary exhaust steam can be found, the benefits would be:

- (a) No requirement for additional kW rating on generators to power refrigerant compressors.
- (b) Smoothing out of exhaust steam flow quantity by making air conditioning load subtractive from this quantity in the tropics instead of additive.
- (c) Opening made for fitting of an LP feed heater.

Such means could be either

- (1) A turbine driven, centrifugal Freon compressor taking steam from the exhaust main and exhausting to the main condenser at sea. 15 lb/sq in gauge steam supply—atmospheric exhaust in harbour.
- (2) Thermo compressors operating on exhaust motive steam in a vacuum refrigeration plant.

Either scheme would derate both generators by at least 50 kW; (2) would be more expensive than (1) but would have the advantage of mechanical simplicity.

THE JOINTLY operated liner service to the west coast of Central America of the Hamburg America Line and the Norddeutscher Lloyd, Bremen, has now been extended to include the ports of Amsterdam and Rotterdam. To mark the occasion of the first call at Amsterdam in the new service, a meeting was held on board the *Vogtland* of the Hapag Line in the Coen harbour at Amsterdam. Mr N. W. A. Overbroek, managing director of Wm H. Müller & Co Ltd, whose firm represents the two German companies in Amsterdam, pointed out that the new service was the first foreign liner service to offer regular sailings between Amsterdam and the west coast of Central America. Weekly sailings can now be offered in this service, alternately by ships of the Hapag/NDL and ships of the Netherlands K.N.S.M.

The modernisation of the Houston plant at Todd Shipyards Corporation has been completed, including the restoration of the 12,000-tons drydock. This yard is located at Greens Bayou in the Main Houston Ship Channel. Todd was established in Houston in 1941 and the present shipyard was acquired in 1949. The Houston Division is now in a position to increase its shiprepair and drydocking services and can handle all types of vessels including the larger tonnage using the improved facilities of the port. The appointment of L. E. Gilbreath as general manager of the Houston Division has been announced. He succeeds the late Russell W. Bowes in this capacity. Mr Gilbreath joined the Todd organisation at Seattle in 1940 and was transferred to the Houston plant in 1956 assuming the position of general superintendent. He became assistant general manager in 1958.

The "Georgi Dimitrov" shipyard at Varna, Bulgaria, has begun the construction of a vessel of 5,000 dwt, the largest it has yet built. The owners are the Bulgarian state shipping concern. The vessel will be 33ft long with a beam of 49ft 2in, and will be driven by diesel engines developing 3,120 bhp to give a service speed of 14 knots. The largest ship previously built by the yard was of 3,000 dwt.

NEW CONTRACTS

Shipowners	No. of Ships	Type	Tons d.w. (gross)	Dimensions (ft.) L.b.p.(o.a.) x B x D.(dft.)	Delivery	Speed (knots)	Propelling Machinery	Total h.p.	Engine Builders	Shipbuilders
Yards in Great Britain and Northern Ireland										
United Ship Repair Yards, Poland	1	Floating dock	5,500 capacity	(450) x 93.5	1961	—	—	—	—	Furness S.B. Co
Simon Handling Engineers	1	Pontoon	—	—	—	—	—	—	—	Richard Dunston, Hessle
British owners	1	Yacht	(120)	—	1962	—	Tw-scr. diesel	—	—	Ailsa S.B. Co
P & O Group	1	—	11,400/13,400	470	1962/3	15	Sulzer diesel	7,000	D. Rowan Barclay Curle	Wm. Hamilton & Co
P & O Group	2	—	11,400/13,400	470	1962/3	15	Sulzer diesel	7,000	D. Rowan Barclay Curle	Chas. Connell & Co
Overseas Yards										
Naess Group	1	Bulk carrier	37,700	—	—	—	Diesel	—	—	Rheinstahl Nordseewerke
U.S.S.R.	(322)	Tanker	19,000	—	—	—	Sulzer diesel	—	H. Cegielski	Stocznia Gdanska
Chinese Govt.	2	Tankers	19,000	—	—	—	Sulzer diesel	—	H. Cegielski	Stocznia Gdanska
Jorgen Jensen	1	Tanker	66,500	—	1964	—	Geared turbine	—	—	Akers M.V.
N. R. Bugge	1	Tanker	41,000	—	1963	—	B & W diesel	15,000	Shipbuilders	*Akers M.V.
A. P. Moller	2	Cargo	9,000	—	1962	—	B & W diesel	—	Shipbuilders	Elsinore S.B. Co
D/S Oresund	1	Pass./car ferry	—	210(237.95) x — x (13.2)	1962	—	Diesel	—	—	Aalborg Vaerft
Vereenigde Nederlandsche Scheep. Mij.	1	Cargo	12,000	—	—	18	Diesel	10,600	Gebr. Stork	P. Smits Jnr.
Vereenigde Nederlandsche Scheep. Mij.	1	Cargo	12,000	—	—	18	Diesel	10,600	Gebr. Stork	C. van der Giessen & Zonen
Great Eastern Shipping Co, Bombay	2	Cargo	12,700	—	1962	16.5	Diesel	—	Shipbuilders	Hitachi S.B. & E. Co

* Hull to be built by Stord Verft

LAUNCHES

Date	Shipowners	Ship's Name and/or Yard No.	Type	Tons d.w. (gross)	Dimensions (ft.) L.b.p.(o.a.) x B x D.(dft.)	Speed (knots)	Propelling Machinery	Total h.p.	Engine Builders	Shipbuilders
Yards in Great Britain and Northern Ireland										
Feb. 2	British & Burmese S.N. Co.	Dalla (1141)	Cargo	10,200 (6,300)	440 x 62.75 x 39.75 (26.2)	14	B & W diesel	5,850	J.G. Kincaid	Lithgows
Feb. 6	Denizcilik Bankasi T.A.O.	Pendik (804)	Ferry	(1,000)	210 x 36 x 12.75 (12.58)	15	Tw-scr. steam recip	1,600	Shipbuilders/Christiansen & Meyer	Fairfield S.B. Co
Feb. 6	Denizcilik Bankasi T.A.O.	Kavaji (805)	Ferry	(1,000)	210 x 36 x 12.75 (12.58)	15	Tw-scr. steam recip	1,600	Shipbuilders/Christiansen & Meyer	Fairfield S.B. Co
Overseas Yards										
Dec. —	U.S.S.R.	Debalzewo (415)	Bulk carrier	9,500 (4,180)	426.5 x 58 x (26.2)	14.25	M.A.N. diesel	5,400	D.M.R.	VEB Warnowwerft
Dec. 8	Commissao de Marinha Mercante	Tambau (131213)	Cargo	5,000 (4,180)	331.5(355.2) x 49.75 (26.25(21.9))	12.5	Steam recip with exhaust turbine	2,500	Zgoda	Stocznia Gdanska
Dec. 12	U.S.S.R.	— (151406)	Cargo	5,900 (4,500)	377.25(406.2) x 54.75 (27.58(22.95))	14.5	5-cyl diesel	4,500	Sulzer Bros	Stocznia Gdanska
Dec. 15	U.S.S.R.	Mir (115008)	Factory trawler	1,250 (2,600)	241.1(278.9) x 45.25 (23.33(17.75))	12.5	8-cyl diesel	2,400	Sulzer Bros	Stocznia Gdanska
Dec. 23	Commissao de Marinha Mercante	Boa Viagem (131214)	Cargo	5,000 (4,180)	331.5(355.2) x 49.75 (26.25(21.9))	12.5	Steam recip with exhaust turbine	2,500	Zgoda	Stocznia Gdanska
Dec. 31	U.S.S.R.	— (151407)	Cargo	5,900 (4,500)	377.25(406.2) x 54.75 (27.58(22.95))	14.5	5-cyl diesel	4,500	Sulzer Bros	Stocznia Gdanska
Jan. 14	Universe Tankships	J. Louis (84)	Bulk carrier	32,500 (20,000)	635 x 90 x 51.1(34.58)	15.75	Geared turbine	12,500	G.E.C.	National Bulk Carriers
Jan. 20	A/S D/S paa Bornholm of 1866	Bornholm (780)	Pass.	(4,300)	298.58 x 50.9 (26.58(15.1))	16.5	Diesel	4,600	Shipbuilders	Burmeister & Wain
Jan. 25	Naviera Castellana S.A.	— (116)	Cargo	7,000 (5,000)	412.2 x 54.5 x (31.2)	14	Diesel	4,000	—	Empresa Nacional Bazan, Cartagena
Jan. 28	Cie. Generale Transatlantique	Fort de France (312)	Refrig. cargo	6,000 (4,990)	346.1 x 51.9 x 36.1(21.42)	17	Doxford diesel	7,800	Shipbuilders	Ch. et At. de Provence
Jan. 30	United Baltic Corp	Baltic Star (1176)	Cargo	2,200 (2,460)	275.42 x 42 x 24.58(15.9)	14.25	Diesel	2,520	M.A.N.	Krogerwerft
Jan. 30	Mobil Tankships	Mobil Endeavour (559)	Tanker	48,600 (30,000)	703(735.42) x 51.5 (38.5)	16.75	Geared turbine	18,000	de Laval	Eriksbergs
Jan. 31	Hector (Western)	Hector Halcyon (13678)	Bulk carrier	22,000 (15,500)	562 x 74 x 46(31.42)	14.8	Diesel	7,500	Gotaverken	Jas. Boel & Fils
Feb. 1	A/S J. Ludwig Mowinkel's Rederi	Hitra (897)	Tanker	35,300 (22,600)	637.75 x 89.5 (47.9(36.1))	17	Geared turbine	16,000	Brown Boveri	Bremer Vulkan
Feb. 9	Shell Tankers N.V.	Ondina	Tanker	47,000	713.58 x 102.5 x 51.5(38)	16.25	Geared turbine	16,000	Shipbuilders	Rotterdamse Droogdok
Feb. 10	Anchor Line	Sidania (805)	Cargo	8,200	430 x 61 x 29(25.5)	17.75	Diesel	9,000	Gebr. Stork	C. van der Giessen & Zonen

TRIAL TRIPS

Date	Shipowners	Ship's Name and/or Yard No.	Type	Tons d.w. (gross)	Dimensions (ft.) L.b.p.(o.a.) x B x D.(dft.)	Speed (knots)	Propelling Machinery	Total h.p.	Engine Builders	Shipbuilders
Overseas Yards										
Oct. —	Polish Ocean Lines	Bydgoszcz (155010)	Cargo	6,000 (3,687)	367.25(407.75) x 54.25 (22.9(21.1))	15.5	6-cyl diesel	5,000	Burmeister & Wain	Stocznia Szczecinska
Nov. 12	U.S.S.R.	Labinsk (154019)	Cargo	10,300 (6,660)	464.5(504.95) x 63.5 (41.2(27.33))	16.25	8-cyl diesel	—	Fiat	Stocznia Gdanska
Dec. —	P. D. Marchessini	Eurybates (848)	Cargo	13,350 (9,870)	488.75(534.2) x 64 x 40 (26.5)	17	Geared turbine	7,000	Shipbuilders	A. G. Weser, Bremerhaven
Dec. —	Lemos & Pateras, London	Dimitris (849)	Cargo	13,477 (9,326)	462.94 x 62 x 40(26.5)	15	7-cyl diesel	6,130	M.A.N.	A. G. Weser, Bremerhaven
Dec. —	U.S.S.R.	Pirjatn	Coastal tanker	4,300	318 x 48.5 x (20)	14	Diesel	2,900	Burmeister & Wain	Rauma Repola O/Y
Dec. —	U.S.S.R.	Zolotoj Rog	Coastal tanker	4,300	318 x 48.5 x (20)	14	Diesel	2,900	Burmeister & Wain	Rauma Repola O/Y
Dec. 14	Sun Oil Co	Texas Sun (611)	Tanker	50,000 (30,000)	710 x 102 x 51(38.95)	17	Geared turbine	20,000	—	Sun S.B. & D.D. Co
Dec. 30	Trinity Nav. Corp, Monrovia	Trinity Challenger (180)	Tanker	42,420 (26,625)	685(723.75) x 97 (49.25(36.58))	17.7	Geared turbine	19,250	G.E.C.	Uddevalvarvet
Jan. —	K. Olsen, Stavanger	Byfjord (531)	Refrig. cargo	5,150 (5,788)	400.25(437.25) x 54.1 (36.1(23.5))	20.1 (T)	10-cyl B & W diesel	7,900	Shipbuilders	Akers M.V.
Jan. —	D/S International, Lysaker	Sigstad (771)	Tanker	19,950 (13,450)	535(560) x 71.9 (40.1(30.9))	15.5	7-cyl diesel	8,750	Shipbuilders	Burmeister & Wain
Jan. —	Sicula Oceanica, Palermo	Amelia Grimaldi (1854)	Tanker	47,720 (29,000)	705.42 x 101.67 x 50.33	17	Geared turbine	17,300	Shipbuilders	Cant. Riuniti dell'Adriatico, Trieste
Jan. —	A/S J. Mowinkel's Rederi, Bergen	Frosta (896)	Tanker	36,586 (21,500)	637.75 x 89.5 (47.9(36.1))	17	Geared turbine	14,500	Brown Boveri	Bremer-Vulkan

MARITIME NEWS IN BRIEF

CAPTAIN J. P. DOBSON has been appointed to command the new Canadian Pacific liner *Empress of Canada* which sails from Liverpool on April 24. Capt Dobson joined the company as a cadet after serving as a midshipman in the *Gloucestershire* in the First World War. He obtained his master's and extra master's certificates in 1926. In 1939 he was navigating officer in the *Empress of Australia* which took the late King George VI and the Queen Mother to Canada. On the outbreak of the Second World War he was called up by the Admiralty and commanded a group of minesweepers out of Harwich. Later he served at Portsmouth, Peterhead and Plymouth. Demobilised in 1946 he rejoined the Canadian Pacific and took his first company command when the new cargo liner *Beaver Glen* was delivered. Later he commanded the *Beaver Cove*, the *Empress of Australia* on trooping duties and the *Empress of Canada*, *Empress of France*, *Empress of Scotland* and *Empress of Britain*, the present flagship of the fleet.

CAPTAIN I. R. FINLAYSON has been appointed superintendent in charge of the submarine branch of the Post Office Engineering Department, in succession to Captain W. H. Leech, who has retired. Captain Finlayson will be in charge of the Post Office's fleet of cable ships.

GROUP CAPTAIN GEORGE BAILEY, chairman of Bailey (Malta) Ltd, has been elected chairman of the Malta Shipowners Association.

MR G. BURDON, Engineer Surveyor-in-Chief in the Consultative Branch of the Ministry of Transport, has retired. He will be succeeded by Mr W. Young, who has been Deputy Engineer Surveyor-in-Chief since 1957.

MR LIONEL CARENE, for 17 years purser in the *Queen Elizabeth*, is to retire in March. Mr Carene, who joined the ship as purser in 1944, will have completed 42 years at sea.

MR JOHN CREEK has been appointed deputy managing director of Fibreglass Ltd in addition to his present appointment as sales director.

MR HUGO HEYMAN, a director of Götaverken A/B from 1925 to 1955, has died at Gothenburg. He was managing director from 1945 until his retirement at the end of 1946.

MR C. V. A. MASTERS has been appointed a director of Associated Coal & Wharf Companies Ltd following the retirement of Mr F. C. Asgill.

LORD DOUGLAS OF KIRTLESIDE, chairman of British European Airways Corporation, has accepted the invitation of the council of the Institute of Shipping & Forwarding Agents to become president as from May 1961. The new chairman-elect is Mr E. T. Maples, director, Crowe & Co (London) Ltd.

The death has occurred of Mr A. Callinicos, shipbroker, for many years acting in the Bristol Channel ports as agent for several Greek shipping companies.

MR F. H. F. LUKE, of Messrs Kok & Luke, Notenstraat 15, Den Haag, has been appointed technical representative in Holland and Belgium for Walco Ltd, pyrotechnic engineers.

CAPT A. C. G. HAWKER, a former commodore of the Orient Line fleet, has retired. Captain Hawker served his apprenticeship with Houlder Bros and entered the Orient Steam Navigation Co Ltd as fifth officer in *Osterley*. He was staff commander of *Orford* at the outbreak of the last war, and stayed with that ship until it was lost by enemy action. He transferred to *Oronsay* as staff commander and was appointed to command *Otranto* in 1940. Following the war he commanded, at various times, the five passenger liners operated by the Orient Line. He was in command of *Oronsay* when she made the first Pacific voyage for the Orient Line in 1954. Captain Hawker came ashore in 1956 for health reasons and was appointed nautical adviser to the management.

A NEW direct shipping link between Amsterdam and New York will be opened on February 28 by the *Nederland N.V. Stoomvaart Mij.* The service, which is run by the Cosmopolitan Line, will be inaugurated by the Norwegian cargo-passenger motorship *Salta*.

THE FAIREY CO LTD announces that its subsidiary Siebe, Gorman & Co Ltd has made an offer for the whole of the issued share capital of C. E. Heinke & Co Ltd. This move will bring together the two outstanding names in the world of diving and underwater apparatus. Both have been established for more than 140 years.

CORY BROTHERS & CO LTD state that the 25-tons floating crane of the Aden Port Trust will be out of commission for approximately six weeks from March 1. The port of Aden will therefore be without a floating crane during the period, the 50-tons floating crane having been scrapped.

GREAT LAKES CARRIER LENGTHENED

After 30 years of continuous service on the Great Lakes the diesel-electric vessel "Cementkarrier" has been lengthened to increase her carrying capacity by about 22 per cent to 3,665 short tons. The vessel was built for Canada Cement Transport Ltd by the Furness Shipbuilding Co Ltd and is fitted with generating and propulsion equipment by the General Electric Co Ltd. After examination this plant was found to be fit for a further period of service without any modification whatever. She was the first vessel to be built in Great Britain to have both diesel-electric propulsion and electrical self-discharging equipment. Other changes made include a modified rudder and new propeller. The recent alterations were carried out by the Lauzon, Quebec, shipyard of the Davie Shipbuilding Co Ltd





MR J. V. C. MALCOLMSON, general manager of the Marine Department of Texaco Inc since 1954, has been elected a vice-president. After service with shipping concerns in Northern Ireland, Mr Malcolmson was appointed to the staff of Lloyd's, of London, in 1930. Six years later he was transferred to the United States as Lloyd's Senior Surveyor in charge of the Philadelphia district. He joined Texaco's Marine Department in 1942 and was appointed assistant general manager in 1952

A meeting is to be held at Newport, Mon, to discuss the building of a large dry dock at the port. If it is generally agreed that a dock is needed, approaches will be made to the Government for aid.

SWISSAIR will take over four new Caravelle jet liners from Scandinavian Airlines System during 1962. The new aircraft will be used mainly on Swissair's European network and will replace the DC-6Bs.

THE submarine *Walrus*, the seventh boat of the *Porpoise* class, has been accepted for service with the Royal Navy. Built by Scotts' Shipbuilding & Engineering Co Ltd, Greenock, the *Walrus* has a length of 295ft 3in and a beam of 26ft 6in.

THE VENTURE PROPERTY & DEVELOPMENT CO LTD, which is the property company of the Chamberlain group of companies, is to develop a new city office block at 56-60 St Mary Axe, 26-31 Bevis Marks and 8-9 Goring Street, London EC3, through its associate company, Yorkwin Investments Ltd. The building will provide nearly 55,000 sq ft of office accommodation, including basement storage space of 850 sq ft and underground parking facilities for 22 cars. The building will be completed in 1962.

THE 1961 SPRING MEETING of the Institute of Welding will be held in London between April 25 and 28, so as to coincide with the Engineering, Marine, Welding & Nuclear Energy Exhibition at Olympia.

THE TROOPSHIP *Dunera* has arrived at Southampton after completing her last trooping voyage. After de-storing the ship will proceed to Newcastle upon Tyne, where a comprehensive conversion will be undertaken by Vickers Armstrong's yard at Hebburn to equip her for her future employment on educational and holiday cruises for young people.

THE SHELL TANKER *Hyalina*, 18,000 dwt, is to be broken up by Hughes Bolckow & Co Ltd. When she was built by Swan Hunter & Wigham Richardson Ltd 13 years ago, the *Hyalina* was the largest single-screw tanker in the world. She is one of 20 Shell tankers being scrapped as unsuitable for present-day requirements.



MR SYDNEY PORTER has been appointed engineer commodore of the BP Tanker Company's fleet. Mr Porter, as briefly recorded in last week's issue, joined the company as a junior engineer in 1923. He was promoted chief engineer in May 1939 and was appointed one of the company's senior post chief engineers in 1957. Mr Porter has been serving in supertankers since 1952 and is at present serving in the "British Queen". He succeeds Mr P. J. Hyde, who has retired

A GROUP of Moscow and Leningrad engineers have designed the first Soviet cushioncraft. The craft will accommodate 30 passengers. It will be 55ft long and 19ft wide and its speed will be between 31 and 37 mph.

THE extension of Malta's new deep-water quay is expected to be completed this autumn. Tankers of 18,000 dwt will be able to berth at the quay and discharge oil for bunkering purposes.

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ACCEPTANCES have been received in respect of 100 per cent of the shares of the Australasian United Steam Navigation Co Ltd, subject to the recent offer by Inchcape & Co Ltd. The whole of the share capital of the Australasian United Steam Navigation Co Ltd is now owned by Inchcape & Co Ltd and its wholly owned subsidiaries. It has been decided to discontinue the direct operation of shipping activities on the Australian coast and to sell the company's fleet of four vessels, two of which have already been sold. The remaining shipping interests of the Australasian United Steam Navigation Co Ltd are being retained and its other activities are being continued.

LINEA "C", together with the Societe Generale de Transports Maritimes, are to operate a joint service in future between Europe and South America. Linea "C" have assumed responsibility for the operation of the combined service and will be responsible for passenger bookings on both companies' vessels. The S.G.T.M.'s liner *Provence* will undergo certain modifications and many improvements will be made to her passenger accommodation. It is expected that she will be ready in the near future and will then operate in the new joint service with the Linea "C" vessels *Federico C* and *Andrea C*.

ALL dock company charges at the port of Santos have been increased by 44 per cent.

THE HAMBURG-AMERIKA LINIE (Hapag) and Norddeutscher Lloyd are including Amsterdam and Rotterdam as ports of call for their joint service between Europe and the west coast of central America. The German firms are acting in cooperation with the Dutch firm Koninklijke Nederlandsche Stoomboot Maatschappij N.V., Amsterdam. The service will be a weekly one, carried out by the K.N.S.M. and the Hapag/N.D.L.

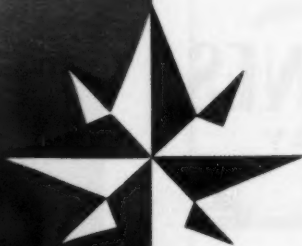
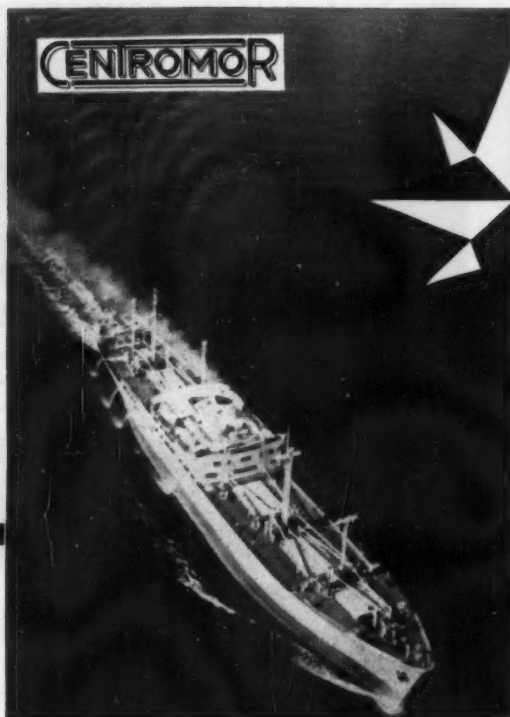
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The iron three-deck passenger and cargo steamer *Ottawa* (ex-Germanic of the White Star Line), owned by the British & North Atlantic Steam Navigation Company, Ltd., Liverpool, has been sold to the Imperial Ottoman Government for £20,000. She is 5,071 tons gross, built at Belfast in 1874 by Messrs. Harland & Wolff, and fitted with new engines and boilers in 1895, speed 16½ knots, dimensions 455 ft. by 45 ft. 2 in. by 34 ft. She will be used as a troop transport.

Messrs. Barclay, Curle & Co. Ltd., of Whiteinch, Glasgow, are building a vessel of large tonnage fitted with internal combustion oil engines. In this departure Messrs. Barclay, Curle & Co. Ltd. are associated with the well-known firm of Messrs. Burmeister & Wain, Ltd., of Copenhagen, who in recent years have done so much towards developing the Diesel engine, and who have made some of the largest oil engines of this type in use on the Continent.

The Cunard Steamship Company have decided to call the large turbine steamer which they are having built at Clydebank by Messrs. John Brown & Co., *Aquitania*. This follows precedent, and revives the name of an old Roman province.

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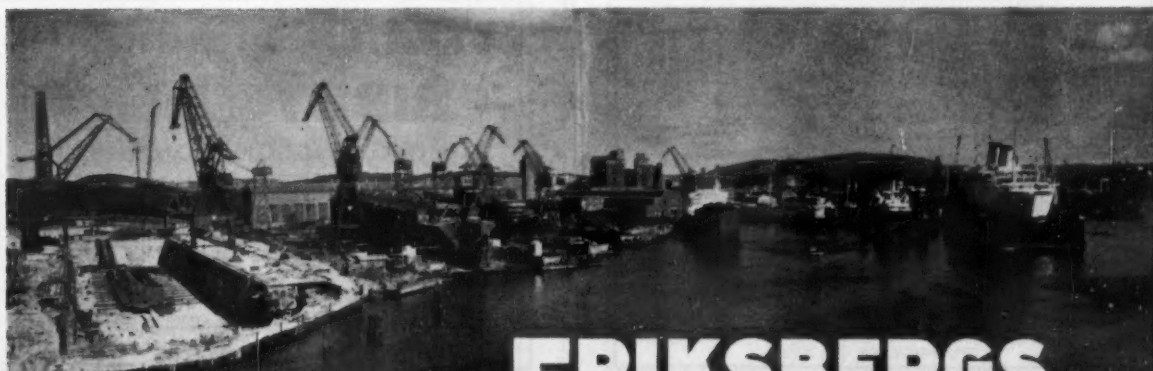
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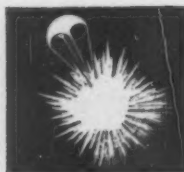
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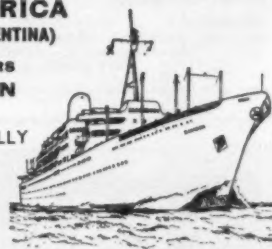
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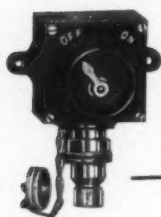
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